BULLETIN OF THE

TAYLOR SOCIETY

AN INTERNATIONAL SOCIETY TO PROMOTE THE SCIENCE
AND THE ART OF ADMINISTRATION AND OF MANAGEMENT

> THE development of cooperation between management and the labor movement for the elimination of industrial waste will develop automatically a mighty agency for the elimination of industrial conflict.
>
> —Hugh Frayne, page 147

PERIODICAL DIVISION

Engineering Societies Building
29 W. Thirty-Ninth St.
New York

JUNE, 1925 VOL. X, NO. 3

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Comment

IN THIS issue appears a new statement by President Brown of the work and aims of the Taylor Society. The statement, because of its new emphasis, is noteworthy; but it should be observed that the aims described have been consistently held by the Society since its organization over fifteen years ago. These aims focus upon the master purpose of helping industry to approach all phases of its probem—production, marketing, human relations, whatsoever others—in the engineering manner. And by engineering manner is meant the open mind and the use of scientific method in search for the truth.

THE open mind toward experience requires the open forum for appraisal of experience. For just as the field of determination of facts by scientific method is growing broader, the field of determination of the significance of the facts is likewise growing broader, this latter determination being a group rather than an individual responsibility. The value of the open mind utilizing the open forum was interestingly illustrated at a recent discussion of scientific management and organized labor.

MANY managers and leaders of labor still believe that organized labor will never tolerate scientific management. Yet there is the significant work of Robert Wolf in the pulp industry, of Otto Beyer in the B. & O. Shops, and now in this issue we are able to present a case in plate glass manufacture reported by Mr. Geoffrey C. Brown. Mr. Brown's experience is significant, for it is a report of official union cooperation even in the use of such proscribed mechanisms as time study and production standards.

STUDENTS of management are indebted to Mr. Brown for preparing the report, to the New York Metropolitan Section for providing the forum, and especially to officials of organized labor for interest and frank discussion. The case itself is of primary importance, for it is in the behavior of individual enterprises that one finds the true story of new motives and attitudes; but frank discussion is nearly as important, for common understanding of the nature and significance of steps already taken is essential to further progress in the right direction.

DURING the days of most vigorous controversy a dozen years ago, thoughtful observers were confident that the facts of the situation which caused controversy were transitory, that there would come a time when organized labor would be disposed to experiment with scientific management, and that eventually the time would come when organized labor would utilize scientific management as its most powerful instrument for promoting labor's interests. There are signs that we are now entering the second of these stages, and we are more confident than ever that the third is not far distant.

ONE should recall that controversy between labor and management concerning scientific management did not arise until after the Eastern Rate Case Hearings of 1910-11. For nearly thirty years Taylor had been developing scientific management technique in various plants, and labor had given it no attention. Then came the rate case hearings with sensational testimony concerning the achievements of scientific management, followed by a public reaction in the nature of a "scientific management bubble," and labor was up in arms. Although the factors which caused labor opposition were in their nature transitory, they were nevertheless very real.

IN THE first place, labor had been compelled by the circumstances of its origin and struggle for status to be conservative in holding its gains and to look with suspicion upon new theories and devices advocated by any representative of management. In the second place, labor's conservatism and suspicion were intensified by industry's leap to utilize the new mechanisms (without understanding the moral elements essential to their vitality) in an effort to get rich quickly, and by the horde of efficiency engineers who arose to exploit industry's susceptibilities; as Taylor said in 1911, "before Fall the woods will be full of quacks who are introducing scientific management, and they will be highly likely to give a black eye to the whole movement." In the third place, the expositions of scientific management were addressed too exclusively to ownership and emphasized too exclusively the advantages to ownership, which permitted a first impression that here perhaps was a new device for exploitation of labor. It has taken nearly fifteen years of observation, experiment and thinking to discover the real meaning of scientific management—that it is essentially cooperative and that without cooperation it cannot exist.

JUST as circumstances attending the publicity given scientific management in 1910-11 caused suspicion on the part of organized labor, so also later circumstances appear to have allayed much of that suspicion. During the subsequent fifteen years certain facts have come to stand out clearly. First, the "scientific management bubble" went the way of all bubbles—the quack efficiency engineer had his short day and was thrown to the discard, and the gullible get-rich-quickly-by-a-device manager paid the price of disillusionment. Second, there have been several instances of the successful development of scientific management in well-known plants, and these have demonstrated that the interests of the workers concerned have been conspicuously advanced. Third, these leading cases have demonstrated also that scientific management does require, as Taylor insisted, a mental revolution on the part of all participants—a mental revolution which is, in effect, common recognition that the law of the functional situation, as Mary Follett puts it, is superior to arbitrary authority—and does establish cooperation in place of antagonism. Fourth, scientific management has demonstrated its capacity for high productivity. Finally, labor has come to recognize—and has declared it recognizes—the necessity, in this period of post-war adjustments, of greater productivity.

FIFTEEN years ago the attitude of organized labor toward scientific management, historically justifiable, was suspicion, rejection, denunciation. Today its attitude, equally justifiable historically, seems to be one of open-minded inquiry and experiment. May not the next step in the evolution—historically probable—be one of adoption, promotion, insistence? We can conceive of no more powerful instrument for organized labor to use in inducing recognition of its place in industrial organization. The period of dominance of militant methods—the weapon of organized labor on the defensive—is past. Defense is no longer to organized labor the most important phase of its problem. It has achieved existence; now it must justify existence by constructive activity. What can be more constructive than insistence on scientific management all along the line—in regularization of industry, in marketing, in master planning and budgeting, in detail processing—with the result of increased productivity to sustain higher wages and a higher standard of living? What more powerful influence can it find to inspire recognition of its place in industry? Imagine the competitive advantage through lower unit costs and lower selling prices of a business having comprehensive, genuine scientific management under the common auspices of sympathetic and cooperating owners, managers and craftsmen!

COMMON auspices means simply technically practicable, common-sense cooperation. There is no evidence that organized labor desires abdication of ownership or of management. The fringe of individualistic, doctrinaire radicals has as yet no substantial influence and will not have unless ownerhip forces it by blind refusal of toleration. Organized labor is generally as conservative as is ownership. The leaders of labor are as sensible of the technical requirements of industrial organization as are leaders among owners. They recognize the requirements of what is called the capitalistic regime of industry; the necessity of risk, of responsible ownership, of management which directs operations and secures profits, of stock issues and dividends, of credit and interest —they are joining the ranks of capitalists by the establishment of banks of their own. They join ownership in wanting less government in business. What they do want in general is recognition of status, better management on the part of ownership which will assure regularity of operations and of income, and an equitable share in the net product of industry. What they want in detail is consideration of their point of view in the establishment of those personal relations and working conditions which touch them at so many points. There appears to be in these facts a basis for genuine scientific management under common auspices.

THE psychological paper printed in this issue is a logical continuation of the preceding papers in the series. Mr. Person's paper constituted a survey which terminated with emphasis on the importance of psychology of total situation; Mr. Mayo's paper developed at length the argument for recognition in management of total situation psychology; now comes Mr. Yoakum's paper critical of current personnel department methodology largely on the ground, if one may be permitted to interpret it that way, that it fails to take into consideration total situation in determining its units of observation and in the correlation of recorded data. We quote a few illustrative passages from Mr. Yoakum's paper: "We are slowly beginning to realize that triviality and importance of events are not measured by the absolute magnitudes of the events but by the more specific relationships they bear to our appreciation of them. Satisfaction with wages, hours, working conditions within the middle ranges, to paraphrase the limitations set to Weber's law, are more dependent upon what the other fellow gets, how long he works, and where he works than upon any direct understanding of the actual differences in amount of or method of payment." Our units of observation with respect to turnover are usually such things as resignations, discharges, layoffs, etc., but, says Mr. Yoakum, "in examining the nature of turnover . . . there seem to be at least four important elements causing the shifting of individuals from one occupation to another . . . (1) adolescent restlessness, (2) differences in individual capacity, (3) social status, and (4) individual interests." . . . . "The continuous struggle with spoiled work, absenteeism, turnover, unemployment, wages, etc., is in the forefront of things we seem always to have with us. My contention is that with better appreciation of the human factor, these, together with accidents, selection, promotion, and the understanding of each other, are open to solution." A great deal has been said of late about the relation, for instance, between opportunity for self-expression and interest in work, as though opportunity for self-expression were something definite and measurable, but as Mr. Yoakum says, "detailed statistics with complete descriptions of the conditions out of which the data arose would be of immensely greater value for solution of proper incentives, than the generalized ratios with which we now attempt to work." Better appreciation of the human factor "necessarily results in the recording of an entirely different series of data than is now customary. It also involves an agreed-upon willingness to experiment."

OTHER papers and discussions presented at the Spring meeting (Ann Arbor, Michigan, May 14 to 16) will appear in later issues of the Bulletin. Apropos of that meeting the Taylor Society desires to express its appreciation of hospitality and courtesies, and of effective cooperation in planning and execution, to the Regents and President of the University of Michigan, to the Local Committee from the staffs of the College of Engineering and the School of Business Administration, and to the Michigan Union. The facilities of the Union building were exceptional—sleeping rooms, dining rooms and convention halls available under one roof —and the courtesies of its staff were much appreciated.

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Scientific Management and Organized Labor Today[1]

An Example of Cooperation Between Management and Organized Labor Which Indicates One Direction of Industrial Progress

By **GEOFFREY C. BROWN**
Consulting Industrial Engineer, East Orange, N. J.

THERE is strong evidence from the tone of articles appearing frequently in labor publications as well as from the recent published utterances of prominent labor leaders that organized labor is gradually withdrawing from its old position of hostility to scientific methods of production and is moving toward a more liberal policy of cooperation with management in a general warfare on industrial waste. This is a sign of progress quite in keeping with the spirit of the times.

It is to be hoped that, as an essential part of this new policy, the unions will seek vigorously to disseminate among their members a knowledge of industrial economics and of the elements of modern management, if for no other reason than the protection of labor against the abuses of unscrupulous managers. Mrs. Gilbreth, discussing time study, refers to this in a paragraph so apposite that I hasten to quote from it.[2] "It (time study) has come to stay. Many labor leaders are opposed to it but their wisest course is to study, foster and cultivate it. They cannot stop its progress . . . The modern managers will obtain it, and the only way to prevent its misuse by unscrupulous managers is that the workmen learn the facts of time study."

It is of equal importance, however, that the unions foster a spread of knowledge among their members as to the facts of scientific management,[3] from a desire to cooperate with fair-minded managers in its promotion throughout the industrial world. The trade union has proved itself a beneficent force for the protection and insurance of its members. It would seem that one of its most promising fields today is that of education.

I believe that those managers are most progressive who now concede the right of labor to organize and to bargain collectively through accredited representatives on questions of wages, hours of work and working conditions. Not to concede this right is, if we reverse the situation, similar to, and about as logical as a refusal on the part of labor to negotiate with management, the accredited agent of an organized group of investors. But if this bargaining or arranging of terms is to be conducted intelligently and with, as it were, all the cards on the table, labor must comprehend the aims and to a considerable degree the technique of management, while management, in its turn, must be equally alive and sympathetic to the spirit of the labor movement. Otherwise the two are working entirely at cross purposes and any attempt at bargaining degenerates into an effort on the part of each to hoodwink the other.

That the prevailing type of trade unionism has been antagonistic to some of the elements of scientific management is beyond question. Professor Robert Franklin Hoxie in his well known analysis enumerates various causes to which this opposition is ascribable.[4]

> (1) To general ignorance on the part of the union workers of the true nature, methods and results of scientific management. (2) To general and fundamental distrust which the workers have acquired from bitter experience of anything new or different in industrial organization and methods. (3) To the crudities of scientific management still in its beginnings, and to the many abuses of it in practice by charlatans, and by ignorant and unscrupulous employers who trade upon the name without understanding the intricate and delicate nature of the thing, the time and patience necessary for its development, or who deliberately violate its spirit and methods for labor-driving purposes.

These are the more important of the familiar objections, which, while they furnish a superficial explanation, do not, as Professor Hoxie states, furnish any very significant answer to the actual question of why labor opposes scientific management.

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[1] A paper presented at a meeting of the New York Metropolitan Section of the Taylor Society, May 21, 1925.

[2] "The Psychology of Management," by Lillian M. Gilbreth, Sturgis and Walton, 1914, (now Macmillan), page 121.

[3] Note: By "scientific management" I do not intend to imply any particular system or group of functions but rather management conducted in the light of scientific inquiry and knowledge. "Management based on facts" briefly conveys this idea.

[4] "Trade Unionism in the United States," Appleton, 1917, page 329.

> They give answer in terms of belief only, without giving any clue to the causes of this belief, and therefore none to the real nature of the opposition—to the forces which have created the opposition, and hence to its strength and significance.

Professor Hoxie finally states his conviction that behind and beneath these more superficial objections there *is* "an essential incompatibility between the basic ideals of prevailing trade unionism and scientific management." This is as follows:[5]

> *Scientific management can function only on the basis of constant and indefinite change of industrial condition*—the constant adoption of new and better processes and methods of production and the unrestrained ability to adapt the mechanical, organic and human factors at its disposal to meet the demands of these new productive processes and methods. On the other hand, *trade unionism of the dominant type can function successfully only through the maintenance of a fixed industrial situation and conditions, extending over a definite period of time.* Scientific management is essentially dynamic in its conception and methods, while trade unionism of the dominant type is effective only where it can secure the strict maintenance of the industrial *status quo,* or can make its influence count effectively in all matters affecting its membership *during the term of a contract.* The conditions necessary to the effectiveness of the one are, therefore, incompatible with the effectiveness of the other.

I reproduce what seem the essential points in Professor Hoxie's analysis partly because this analysis has had wide acceptance as a shrewd statement and explanation of the actual attitude of the unions toward scientific management, and partly on account of its close analogy with events coming within the range of my recent experience.

In the autumn of 1922, during the last months of the depression, I became interested in the reorganization of a small factory[6] situated in the heart of New York's industrial west side. Conditions in this plant were those invariably found in any factory that has operated for many years along the most old-fashioned of traditional lines. This concern had no adequate storeskeeping system, no method of scheduling orders in advance through manufacture, no recorded information as to the productive possibilities of manufacturing operations or machines, and no vestige of a cost system. The financial position of the company had hitherto been visualized by a monthly trial balance drawn from an old-fashioned set of general books, this statement losing all significance because it was not based on inventory figures and did not show actual profit or loss in terms of individual orders or lines of product. Industrial engineers had been called in because the concern had suffered heavily during the depression year of 1921, and, in the absence of a cost system, had not been aware of the seriousness of its position until the books were closed at the end of that year.

Had the problem consisted merely of conducting a physical reorganization of the business and installing whatever elements seemed essential to its survival, it would not have presented extraordinary difficulty. Unfortunately there was present a psychological obstacle which rendered the path of the investigating engineer an extremely thorny one. The workmen were strongly organized in one of the federated unions[7] coming under the jurisdiction of the American Federation of Labor. The management had persistently refused to recognize the union, and relations between the two were of the worst. The business had in ten years suffered from the effects of three disastrous strikes, and the management had grown so accustomed to this expensive type of interruption that it was frequently referred to as an unfortunate but inevitable condition of manufacture.

In spite of these obstacles, the reorganization proceeded slowly and with a certain measure of success. By June of the following year (1923) a fruitful power plant investigation had been completed and most of the elements of a cost system were functioning. What still remained unaccomplished, however, was all that part of the work having directly to do with the factory operations and therefore involving direct contact with the foremen and workmen. A system of scheduling orders in advance through manufacture had still to be installed, and no such system could function effectively until the standard output-capacity of each manufacturing operation had first been established. Many of the operations, also, were being performed in a wasteful manner owing to obsolete equipment and methods, and technical changes in the conduct of certain processes were obviously necessary. All this involved extensive time study, a course which was apparently impossible owing to emphatic refusal on the part of the workmen to submit to time study observation. Initial attempts in this direction had resulted in an incipient strike, and this despite assurances to the workmen that interference with any condition in the existing agreement between the Manufacturers' Association and the Union was in no wise contemplated.

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[5] "Trade Unionism in the United States," page 342.

[6] The Jacques Kahn Mirror Co., Inc.

[7] Glass Bevelers, Mirror Workers & Cutters Union, Local 528.

After a number of ineffectual attempts to win the workmen, it became evident that no further progress could be made unless cooperation was secured from the union—and I was in a decided quandary as how best to frame an approach.

As an initial step the shop steward, who happened to be one of the foremen, was summoned to a conference during the course of which I carefully explained to him the nature and purpose of the methods still to be installed; gave him every assurance of good faith in regard to maintenance of the existing agreement relative to wages, hours, conditions, etc., and then formally invited cooperation from the union in the conduct of whatever steps were necessary to complete the remaining stages of the reorganization. After manifesting some distrust and raising a few objections—which were, fortunately, smoothed out—he seemed to feel the sincerity of the invitation. Before the conference ended, I had his promise to bring the matter up for discussion at the next regular meeting of the Local, and to apprise me quickly of the result.

In a few days the shop steward informed me that he had broached the matter at headquarters, and that it had occasioned considerable dissension among the union membership, causing their division into two factions, one of which was strongly in favor of formally accepting the invitation, the other faction just as emphatically opposed to having the union commit itself by any action whatsoever. There was encouragement, however, in the fact that, according to the shop steward, a *majority* of the members seemed to be in favor of endorsing the introduction of improved methods, and that this majority included both the President and the Secretary of the Local.

On the following day I received a visit from the Walking Delegate who, it quickly transpired, was most decidedly of the dissenting faction. He proved to be an agreeable chap, well informed on the labor question, and, I might add, on industrial economics, and very positive in his conviction that it would be contrary to the very essence of trade unionism to accord the desired coöperation. For three hours we debated the pros and cons of scientific management from the union standpoint, and during this period my adversary, in support of his position, advanced most of Professor Hoxie's analysis. Scientific management would, he said, eventually destroy trade unionism by minute specialization of workmen and consequent destruction of crafts. Experience had shown, moreover, that it tended to drive workmen out of the union, and from this standpoint could operate only to the disadvantage of labor. He held to this point of view despite every argument, and did not seem at all impressed by the oft-repeated declaration that there would be no interference with the union agreement on wages, hours and conditions. He finally departed, giving me a farewell assurance that when the matter again came up at the next meeting, he would strive to the uttermost to defeat any favorable action on the part of the Local.

The reorganization, as intimated, could not proceed unless the necessary time studies were obtained; the latter could not be secured without cooperation from the working force; and this cooperation could only come by fiat of the union. It was therefore of first importance that the union be, by some means, won over.

As a final expedient the shop steward was invited to a second conference, during which a new and different type of appeal was used. This consisted of reading to him excerpts from the 1923 report of George W. Perkins, President of the Cigar Makers' International Union. Most important of these is the following:

> No power on earth can stop the at least gradual introduction and use of improved machinery and progressive methods of production. Any effort in that direction will react against those who attempt it. Our own condition proves that our efforts at restriction were futile and ineffective and injurious. Without any exception any organization since the beginning of the factory system that has attempted to restrict the use of improved methods of production has met with defeat.

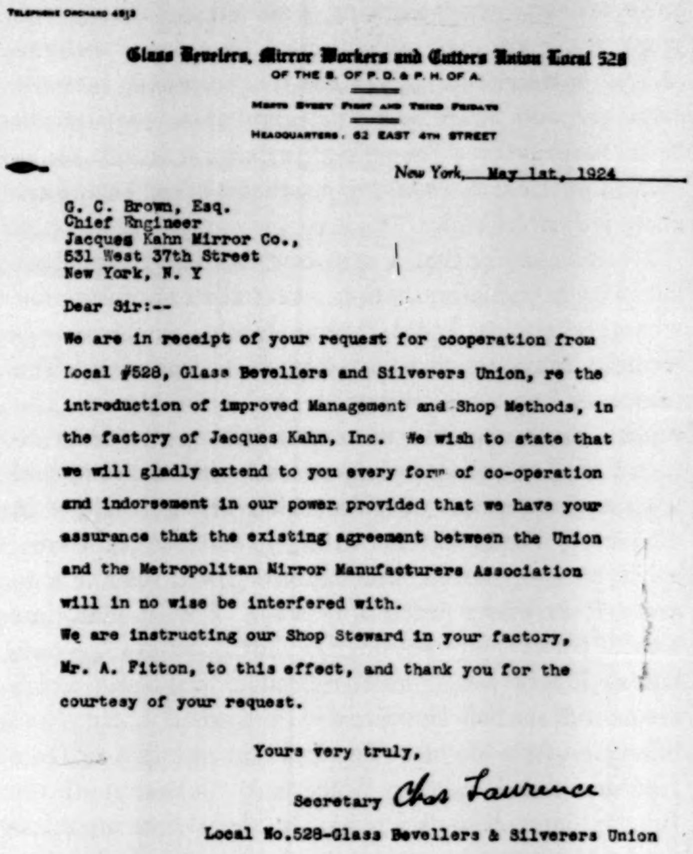
This and other quotations from the report of a well-known labor leader were, as stated, shown to the shop steward who now exhibited great interest. He finally requested that I give them to him in the form of a verbatim copy for presentation at the next meeting of the Local, and concluded the conference by assuring me that he was now on my side and would do everything in his power to obtain favorable action from the union officers.

This final argument carried the day, and the dissenting faction, unable to withstand the logic of one of their own labor leaders, either gave in or were over-ridden. In a few days the steward informed me that the union had decided to extend full endorsement, and that he would, personally, accompany a time study observer into the shop and himself enlist the cooperation of the working force by putting, as it were, the "union label" on the investigation. This he did and time study thenceforward was conducted without any hostile manifestation from the workmen.

It should, perhaps, be stated that no attempt was made to install any form of piece work or bonus system. All other elements of modern production control including an adequate time-keeping system, a perpetual stores inventory, a cost system, advance scheduling of orders through manufacture, time study, etc., were, however, successfully introduced. As the various stages of this reorganization, and the economies which were effected through it, have been described at length in a series of articles appearing recently in a leading industrial magazine,[8] I will not, at this time, dwell further upon them, save to add one detail which has not, I think, yet been published.

Glancing back over the entire investigation which extended over a period of more than two years, and measuring the various results against each other, it becomes evident that the most important single gain lay in the establishment of a spirit of cooperation and what might be termed *sane* relations between management and union. The absence of this characteristic had undoubtedly for many years been a source of heavy expense and demoralization to this business. As evidence of the fact that different relations were established, I submit a letter (see next column) from the Local Secretary received by me shortly after the union had extended its endorsement to the introduction of improved methods in this plant. I regard it as an interesting "sign of the times."

Since receiving this letter I have been conscious of a growing sense of its significance and it is my deep conviction that the spirit of cooperation thus conveyed is of incalculable importance to industry today. If, abolishing ruinous strikes, endless friction and an assumed divergence of interest between industrial management and organized labor, these two great forces might be reconciled to a common interest in producing the things that we need in the most efficient way that modern science with all its resources can devise, would not organized labor, management, industry and society at large benefit to an immeasurable degree? This proposition would seem self-evident, yet we have been taught in the past that organized labor and scientific production management are fundamentally incompatible, that they are irreconcilable from the economic standpoint, and that any attempt at cooperation between them is in the nature of wasted time and effort. I humbly submit that these old beliefs are rapidly becoming obsolete, and that the logic of events is throwing into constant relief the fact that the troublesome problems in our human industrial relations may be adequately solved only by development and exercise of this same principle of cooperation.



Telephone Orchard 4913

Glass Bevelers, Mirror Workers and Cutters Union Local 528
OF THE B. OF P. D. & P. H. OF A.
Meets Every First and Third Fridays
Headquarters, 62 East 4th Street

New York, May 1st, 1924

G. C. Brown, Esq.
Chief Engineer
Jacques Kahn Mirror Co.,
531 West 37th Street
New York, N. Y

Dear Sir:--

We are in receipt of your request for cooperation from Local #528, Glass Bevellers and Silverers Union, re the introduction of improved Management and Shop Methods, in the factory of Jacques Kahn, Inc. We wish to state that we will gladly extend to you every form of co-operation and indorsement in our power provided that we have your assurance that the existing agreement between the Union and the Metropolitan Mirror Manufacturers Association will in no wise be interfered with.

We are instructing our Shop Steward in your factory, Mr. A. Fitton, to this effect, and thank you for the courtesy of your request.

Yours very truly,

Secretary Chas Laurence

Local No.528-Glass Bevellers & Silverers Union

In order to ascertain in a general way what the probable outcome would be, if, as in the case of the mirror factory just described, I were to seek, under different conditions, similar cooperation from other unions, I decided a short time ago to communicate with a number of the important affiliated crafts, and explaining the details of my recent experience, ask for a candid statement on this general subject of cooperation, from some responsible officer in each organization. So I had transmitted to the President or General Secretary of fifteen of the largest trade unions in the American Federation of Labor a letter containing the following question. *"Taking for granted the principle of collective bargaining and the careful maintenance of existing agreements between employer and union, do you favor close cooperation between organized labor and management in maintaining efficient methods of production, and in eliminating industrial waste?"*[9]

---

[8] "Profitable Methods for the Small Factory," by G. C. Brown, *Management and Administration*, February to July, 1924.

I must confess that I sent out this letter anticipating only a partial response, and fully expecting that whatever replies I did receive would be of an extremely cautious and non-commital character. The response, however, was quick and sympathetic. The replies came, for the most part, from the International or General President of each organization, and with the exception of two which are anomalous in character, these letters strongly endorse this new spirit of cooperation and express great readiness to assist it in every practicable way. I wish that time would permit my reading all these letters[10] aloud, but as it will not, I shall reproduce only one which seems of special significance, and shall then dwell briefly on its contents. The letter in question is from International President William H. Johnston of the International Association of Machinists, an organization with 103,000 members, and it runs as follows:

> My dear Mr. Brown:
>
> I have read your letter with a great deal of interest and in reply wish to assure you we welcome the assistance of all students of industrial affairs in developing a better understanding between employers and employees and establishing a real spirit of true cooperation.
>
> Replying directly to your question I will say that we do favor, without reservation, close cooperation between Organized Labor and Management in maintaining efficient methods of production and in eliminating industrial waste. We believe that the workers in industry are the ones who suffer most for the waste and lack of efficiency in modern industry.
>
> In order that you may have my views on this question I am sending you under separate cover a copy of an address which I delivered before the Seventh Annual Conference of the International Y. M. C. A. held at Silver Bay in August of last year . . . . . You will note the subject is "New Policies for Modern Conditions."
>
> Under separate cover I am also sending you an article reprinted from the *Railway Age*, entitled "The Employee Morale Problem of Our Railroads," by O. S. Beyer, Jr., and an address delivered by myself entitled "Cooperation—Organized Railroad Labor's Contribution."
>
> Trusting that this will give you a comprehensive idea of the advanced position of our Organization, I remain with best wishes
>
> Very truly yours,
> (signed) William H. Johnston,
> International President.

The two printed speeches and the article referred to deal comprehensively with results from the union-management cooperative plan inaugurated in February, 1923, by the joint efforts of President Johnston and President Willard of the Baltimore and Ohio System, and introduced into the shops of that railroad. Similar plans are now being rapidly developed on the Canadian National and Chesapeake and Ohio Railways. The details of this plan and the results thus far obtained on the Baltimore and Ohio are so interesting that I feel justified in reproducing the following excerpts from Mr. Johnston's Silver Bay Address.

> The foundation upon which this new policy rests is simply cooperation for mutual interest. In order that this may be realized these five important steps must be agreed to.
>
> *First*—Full and cordial recognition of the shopmen's *bona fide* unions as the properly accredited agents of the employees.
>
> *Second*—Accord to our unions and their representatives constructive, as well as protective, functions in industry.
>
> *Third*—Agreement between our unions and management to cooperate for improved public service.
>
> *Fourth*—Agreement to share fairly the consequent benefits in steadier and more employment, better working conditions, and larger yearly wage incomes.
>
> *Fifth*—Perfection of definite joint union-management administrative machinery to accomplish these purposes.

Mr. Johnston then briefly elaborates and explains each of these five steps. I will reproduce only step two and step five as thus elaborated and explained.

> *Step Two*—Accord our unions constructive as well as protective functions in the operation of industry, means the enlargement of the scope of collective bargaining. Where we now enjoy recognition and have agreements with management our task is simply to negotiate wage rates, working rules and to prevent injustices to our members. This is our protective function. Since, however, industry will afford better wages and working conditions when waste is reduced, we are ready through our organization to join with management in the elimination of such waste. In short, we expect industry

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[9] The list of officers to whom this letter was transmitted included the following in addition to those quoted on page 138: P. A. Rickert, General President, United Garment Workers of America; Hugh Frayne, General Organizer, American Federation of Labor; A. J. Berres, Secretary-Treasurer, Metal Trades Department, American Federation of Labor; Arthur Austen, Secretary-Treasurer, International Brotherhood of Foundry Employees; E. C. Davidson, General Secretary, International Association of Machinists; E. Lewis Evans, Secretary-Treasurer, Tobacco Workers International Union; B. A. Larger, General Secretary, United Garment Workers of America; Sara A. Conboy, Secretary-Treasurer, United Textile Workers of America; Martin Lawlor, Secretary-Treasurer, United Hatters of North America; C. L. Baine, Secretary-Treasurer, Boot & Shoe Workers Union.

[10] Typical letters or excerpts from letters received from labor union officers in addition to that of President Johnston are printed in an Appendix on pages 138-9.

> to provide us with an increasingly better standard of living and we are prepared to help industry to do it. At the same time we are also prepared to help industry better its services to the public. This constitutes our constructive function.
>
> *Step Five*—Establishment of joint machinery of cooperation, really means doing something practical about Step No. 2, that is, "according the unions constructive functions in management." Thus, in railroad shop service the regular local system committees of the organized shopmen confer at regularly appointed times with parallel committees representing management. These conferences consider matters of shop policy and operation, such as job analysis, better apprentice training and education, scheduling and routing of work, balancing of shop forces, hiring new men, developing new lines of work, stabilizing employment and providing better tools and equipment. The machinery of cooperation is in addition to that which usually prevails for the adjustment of wages, working rules and grievances. The latter matters are handled as they always have been, namely, by the regularly developed machinery which has become virtually standard under collective bargaining.

Mr. Johnston's report of results, after more than a year of successful operation under the cooperative plan, is as follows:

> You may say, "It sounds good, but does it work? Is it practical?" We have carried much grist to the mill since the policy of cooperation was first introduced in the Glenwood Shops of the Baltimore and Ohio Railroad, and in that case the theory of union-management cooperation has proven sound. The workers and railroad have both benefitted; the shopmen by steadier work, recognition of organizations as worthy parts of the structure of their industry, improved working conditions, increased yearly wage incomes, fewer grievances and better equipment and methods for doing work; and the management by steadier production, better quality of work, greater economy of material, increased output, new business, less labor turnover and better shop morale. The public, too, has benefitted through better service, less delay and safer travel.
>
> We started in one shop of the B. & O. It developed so well that it has been extended to every shop on the road, forty-five in number, and last year the operating expenses on the Baltimore and Ohio were much less and they got more miles out of their cars than any other road in the eastern country. The work was done well and everybody has benefitted thereby . . . . Sir Henry Thornton, President of the Canadian National, and a number of other railroad officials are waiting for us to help them get the plan started.

These are the general results reported by Mr. Johnston last August (1924).

Returning to the Hoxie analysis with its alleged incompatibility between trade unionism and scientific management, it would seem that this incompatibility loses somewhat in force when subjected to a close examination, and that if the possibility of cooperation between organized labor and management be admitted, it disappears entirely. Briefly restated, it is that trade unionism exists solely by virtue of its ability to maintain a fixed industrial situation and conditions over a definite period of time, while scientific management can function only on the basis of constant and indefinite change of industrial condition. The trade union, in its protective role, has been concerned largely with bringing external pressure to bear on the general economic situation so as to secure for its members favorable contracts as to basic wages, hours of work and working conditions. Scientific management, on the other hand, operates within the general economic situation, accepting wages as determined by the law of supply and demand, and then reducing labor cost by increasing productivity through improved equipment and methods. I can see no fundamental reason why these two processes, protection from without and development or evolution from within, cannot cooperate and function together. Thus *protective* features such as minimum wage rates and hours of work may still be established and maintained through general contracts—while the *dynamic* or *evolving* side of production such as the inevitable development of better equipment and improved productive methods, may be guided and controlled by joint committees representing labor and management along the lines of the Baltimore and Ohio plan, or by some other suitable joint arrangement. The general contract may be periodically revised as the need arises.

That Professor Hoxie recognized in scientific management and organized labor two forces which must in the nature of progress find a common ground is indicated by one of the closing paragraphs in his report to the United States Commission on Industrial Relations, submitted in 1915 after a thorough investigation into numerous industries in which principles of scientific management were in actual operation at that time. This is the paragraph:[11]

> The fact to face is that your commission is dealing in this matter, with two forces neither of which may nor will be sacrificed to the other. Also, conflict between them would simply be marking time against the inevitable. It is in the nature of things that they both live and fructify. How, then, may they develop together?

It would seem that this question—"How may they develop together?" propounded nearly ten years ago, and inescapable in its demand for an answer rising superior to old prejudice and narrow class feeling, is, in this day, finding what may be at least the beginning of such an answer. There is abundant evidence that the unions are acquiring a broader and more liberal attitude toward industrial progress, whether it be along the lines of new mechanical equipment or scientific productive methods. It is conceivable that even as when the linotype machine was invented the hand typesetters' union welcomed it, mastered it and finally won the right to its exclusive operation, so will the unions presently recognize and generally endorse progressive methods of production, and by intelligent cooperation, proceed to use them to the mutual advantage of both labor and management.

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[11] "Scientific Management and Labor," Appleton, 1915, page 137.

In the gradual development of such cooperation much must, of necessity, be tested in the light of actual experience and demonstration. It must prove itself from the economic standpoint. Labor must learn and management must learn. Labor, as earlier stated, must know a good deal about the aims and the general technique of management, while management, in its turn, must be prepared to yield up much of its militaristic heritage, "the employer's old prerogative of despotism" and become sympathetic to the spirit of the labor movement. Old prejudices must be overcome and the ghosts of old animosities resulting from more than a century of intermittent conflict, must be laid. With the principle of cooperation as a basis, however, these developments and adjustments should follow in sequence, and with a concrete example like that of the Baltimore and Ohio before us, John Stuart Mill's ideal of "human beings working with or for one another in relations not involving dependence" would seem, even now, to be approaching a partial realization.

It will doubtless be urged as an objection to any such plan of cooperation that it is without adequate economic safeguards, and that it will expose industry to encroachments on the part of organized labor, particularly in the matter of wages. This argument presupposes the old conflict and divergence of interest between organized labor and management, which the principle of cooperation is especially designed to obviate, and it takes no account of the dawning consciousness of labor that its future welfare rests fundamentally on the elimination of industrial waste. Organized labor wants from industry the highest wages that industry can economically afford. Progressive management wants labor to receive the highest wages consistent with an economic labor cost. High wages do not necessarily mean high labor cost. Dr. Taylor may be said to have fostered the development of a new attitude toward wage payment by repeatedly demonstrating the fact that high wages may go hand in hand with low labor cost, while low wages are frequently not only incidental to, but an actual cause of high labor cost. A recent writer has conveyed this idea in the following apt sentence. "It is not what you pay, but what you get for what you pay that counts." It seems a logical inference that with organized labor and management cooperating to maintain efficient methods of production questions relative to wages, hours of work and working conditions will find pacific and reasonable adjustment where these factors have in the past been adjusted only through costly delays in production.

Believing profoundly in the importance, both to modern industry and to society at large, of this more progressive attitude on the part of organized labor, I cannot escape a conviction that there is here a new responsibility for followers of scientific management and that by meeting this development half-way and extending to it every reasonable encouragement, industrial executives will be advancing in a manner logically consistent with the spirit of the times.

It would be difficult to find a more fitting conclusion for this paper than the closing paragraph of F. W. Taylor's presidential address, read before the American Society of Mechanical Engineers, nearly twenty years ago. It is as follows:

> In concluding let me say that we are now but on the threshold of the coming era of true cooperation. The time is fast going by for the great personal or individual achievement of any one man standing alone and without the help of those around him. And the time is coming when all great things will be done by the cooperation of many men in which each man performs that function for which he is best suited, each man preserves his own individuality and is supreme in his particular function, and each man at the same time loses none of his originality and proper personal initiative, and yet is controlled by and must work harmoniously with many other men.

Appendix

Following are significant excerpts from letters received from union leaders in addition to that from President Johnston commented on above. See page 136.

1. *From William Green, President, American Federation of Labor.*

"Your letter of April 23rd interests me very deeply. Your experience in reorganizing the Mirror factory is additional practical confirmation of the statements that I have been making recently in my public addresses. So firmly do I believe that acceptance of collective bargaining is the basis for relations between management and employees, that I am seeking to focus the thought of all those concerned for industrial relations, as well as the labor movement, upon two primary steps—organization and education. Until collective bargaining as a principle is accepted and put into practice, the union is forced to give priority to militant policies.

In a statement which I presented in a round table discussion in New York recently, I pointed out the industrial waste accruing from policies of hostility to instead of cooperation with trade unions. I am enclosing copy of that address, referring you specifically to the discussion beginning on page 6. I am also sending to you under separate cover, copy of the May issue of the *American Federationist*, containing an editorial entitled "A power policy" which bears on the same proposition.

When collective bargaining is accepted as a basic principle of industrial relations, the way is then opened for practically limitless opportunity for cooperation between management and employees for the development of more efficient practices and processes, provided labor maintains its own organization as the agency competent to make decisions for labor.

In talking to the Harvard Union recently I said: "The trade union movement has been passing through that period when physical controversies and the tactics of force have been most effective; it is now in the period when its leaders must seek the conference room, and there by exposition and demonstration convince conferences of the justice and wisdom of Labor's position. In such service Labor is finding a special need for trained representatives and effective information. The new idea of joint responsibility in approaching the solution of industrial problems on the part of the employees, management and employers is being tried in various lines of industry. As a result of the shopmen's strike in 1922 the management and employees of the B. & O. Railroad have been working together in a constructive way and with what seems to be most successful results.

I am deeply concerned that labor shall have the opportunity to participate in the constructive work.

2. *From George W. Perkins, President, Cigar Makers International Union.*

I may say to you that I am in full accord with the following fundamental principles, which the American Federation of Labor has always sponsored and which it has more pronouncedly and emphatically sponsored for the last two years, that is—Democracy in industry in which management, engineering skill, labor and capital should participate. Labor alone cannot bring about a worthwhile system. Neither can capital. But with the four fundamental elements referred to, a new system can be evolved which will protect the rights and interests of all of society and especially those who give service. We are not in favor of turning down the present system. We believe in building it up and improving it.

3. *From William E. Bryan, General President, United Leather Workers' International Union.*

Your letter addressed to our Secretary, Mr. Pfeiffer, was handed to me for my information and I assure you that the subject matter is quite interesting.

Your request for a letter as to the policies and purposes of our organization that would sustain your ideas upon cooperation between management and the Union representatives can, I think, be best served in sending you an article which was published in our Official Journal, January, 1925. It specifically deals with the subject, places us squarely in harmony with your views and antedates your request.

I would appreciate it very much if you will send me a copy of the paper you have prepared upon this subject.

4. *From M. F. Tighe, President, Amalgamated Association of Iron, Steel and Tin Workers.*

Cooperation between men and management where the principle of collective bargaining is recognized and established, is a fundamental of our organization, and I may say that it is the only method for successfully working out the various problems that enter into industrial life.

In my judgment there never will be real progress in the establishment of proper productive standards until there is a general recognition of the above principle.

5. *From James W. Kline, General President, International Brotherhood of Blacksmiths, Drop Forgers and Helpers.*

Cooperation—It sounds well, and if both sides will honestly try to cooperate, it will succeed. It must, however, come from the top down.

Replying to your question direct—Yes, I heartily believe first in the principle of collective bargaining and then close cooperation between organized labor and management to maintain efficient methods of production and eliminate industrial waste.

6. *From G. M. Bugniazet, International Secretary, International Brotherhood of Electrical Workers.*

Your favor of February 6th to Mr. Ford is at hand and I will say the policy of our organization has always been to cooperate with the employer and wherever he would allow us to suggest to him some improvement in the way work should be done, we have always been pleased to accept that opportunity.

7. *From Victor Kleiber, General Secretary, International Molders Union of North America.*

I am in receipt of yours of recent date requesting letter relative to our organization favoring close cooperation between organized labor and industrial management.

In reply will say that the International Molders Union has for many years annually entered into wage agreements with employers, and our policy is to continue seeking agreements with employers for close cooperation whenever and wherever possible.

Discussion

Robert B. Wolf.[12] I have read Mr. Brown's paper with very great interest and am in absolute accord with his major thesis that cooperation between organized labor and scientific management is entirely practicable.

He speaks from experience and knows whereof he speaks. I wish, therefore, to add my testimony to his, for I also have demonstrated that organized labor is willing, and even anxious, to cooperate with management, provided that management is truly scientific.

To obtain cooperation management must put itself in the right attitude toward the labor movement, first, by recognizing the worker's right to organize; second, by sincerely desiring to integrate the movement into the working process as a necessary part of the process; and, third, by determining to keep the workers fully informed as to the economic results of their efforts, so that just compensation for work performed will be thereby assured.

Mr. Brown points out the necessity for education. I assume he means that the work itself must be educational. If so, I fully endorse his views. Any job that does not enable the workman to grow mentally is degrading and if management is to be genuinely scientific it must concentrate its efforts upon the elimination of such jobs from industry.

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[12] Consulting Engineer, New York City.

It is not enough to obtain the consent of organized labor to make time studies. The mere fact that such consent has been obtained from the union or the "chairman" does not necessarily make the "task and bonus setting" process any more acceptable to the individual workman.

There are two fundamental reasons why the worker subconsciously resents the process of job predetermination by others, no matter how expert the observer may be. They are implied in the words "task" and "bonus."

In the first place, the worker believes that he should be his own task setter and he instinctively feels that if the management were skillful enough it would make it possible for him to participate in the process. Second, he looks upon the bonus as a "bait," and, whether he is entirely conscious of the fact or not, it lowers his self respect. The same, of course, applies, more or less, to piece work, or any other form of financial incentive. A workman expressed it to me one time as follows: "Every man likes to do a good job, but he doesn't like to be *bribed* to do it."

Mr. Brown has rendered a real service by calling attention to the inadequacy of the Hoxie report. Hoxie's observations did not get to the core of the reason why organized labor opposes scientific management. It is true, as the report points out, that scientific management can function only where there is constant growth and change in industrial conditions. What scientific management really does, if it functions properly, is integrate all plant activity into a self conscious whole, thus insuring consciousness of accomplishment without which there can be no real growth.

The labor movement, contrary to Hoxie's generalization, however, does not depend upon the preservation of the status quo for its existence. On the contrary, it is a dynamic force whose very existence depends upon growth in intelligence and, therefore, growth in ability to express consciously the creative power which is the outstanding characteristic of Man. It is largely a lack of knowledge of the science and art of human engineering which is responsible for the creation of conditions in the industrial world which have kept labor on the defensive.

The trade union is a "local"[13] expression of the craft idea charged with tremendous potential power for constructive work. It will function in the departmental activities of the plant when management creates the conditions which will make the work itself the main center of interest.

In a speech before the American Society of Mechanical Engineers, Nov. 5, 1920, Mr. Samuel Gompers expressed this thought in the following words:

> I see, however, before the labor movement a great future, as I also see a great future before the engineering profession. The engineer should join hands with the workman—both devoting their energies to one cause, namely, the development of a kind of industry and a kind of work in which the man will learn the processes of production and each day will have increasing opportunities to develop those human functions which are essentially intelligent.

More recently, in the *American Federationist* of May, 1925, Mr. William Green, present President of the American Federation of Labor, commented editorially as follows:

> The major problem of management then becomes how to utilize the union power pool for constructive production purposes. The Union no longer harried by attacks upon its right to bargain for its members is free to turn to the problems of the daily job. That involves cooperation which in turn involves the development of joint agencies and technique within the industry whereby both management and unions can utilize their past experience in finding improved work practices and methods. The result will release creative human energy and provide channels to permeate the industrial structure seeking out trouble centers, causes of waste and industrial instability, bad workmanship.
>
> The basic problem of personnel relations upon which management of each industry makes its decision is, therefore, its attitude to the union—to resist this creative force or utilize it.
>
> The strength of the labor movement has been its consuming passion for the welfare of men and women. It has been sanctified by reverence for the possibilities latent in every individual. It has sought material comforts in order to uplift men to a higher plane of development. But there has been danger in the multiplicity of comforts and luxuries that have made work less laborious. Have we kept our spirits clean and fit, or have we become of softer moral fiber?
>
> With the gaining of union power, have our humanitarian ideals kept pace?
>
> As trade unions have become more important factors in public affairs, have we kept ourselves free from the taint of commercialism?
>
> Is there singleness of purpose within all our ranks?
>
> Have we kept faith with those who sacrificed to build this movement by performing the duties necessary to maintain the organization? The benefits of unions entail duties.

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[13] It is significant that the individual trade union is called a "Local."

> Have we had the courage to make the fight for rights and higher standards, or have we cautiously yielded lest we jeopardize our jobs and our security?
>
> Do we seek fair agreements or advantages for ourselves?
>
> Do we belong to the valiant souls who, indifferent to personal hazards, press forward to advance a great cause?

Again, in an address delivered before the Philadelphia Convention of the Workers' Education Bureau, in April of this year, Mr. Green made the following statements:

> It is one thing to organize. It is another matter to intelligently direct and guide organized forces along constructive lines towards the accomplishment of a definite purpose and the realization of a fixed goal. . . . It (the labor movement) contains vast opportunities for enlightened education and spiritual advancement.

The concluding words of his paper before this convention, to my mind, should fire the imagination of executives operating plants along scientific lines. This statement was as follows: "The trade union is the agency and education is the method by which labor confidently expects to make material and spiritual progress."

In the face of such expressions from men high in the ranks of organized labor, how is it possible for us to evade the very definite responsibility of so organizing our industries that we will awaken "interest in creation, in craftsmanship, and in contribution of the workers' intelligence to management"?[14]

There is a fundamental difference between the motives actuating the Human kingdom and the other three kingdoms—Mineral, Vegetable, and Animal—which preceded it in the evolutionary process, and the key to an understanding of this difference in motives is to be found in the emphasis placed upon time study by prominent managing groups. I believe that we have often used time studies unintelligently. Mr. Brown points out the emphatic refusal of the workmen to submit to observation. I believe that this was due almost entirely to a feeling upon the part of the workman that he is capable of initiating changes for himself and he instinctively resents the implication that he is not a thinking being, and, therefore, needs to be observed by the "Task and Rate Setting" Department.

Why not reverse the process by recording for the workman's benefit the effect of his actions upon the material he is handling, allowing him the greatest possible latitude to accomplish these results in his own way? If this is done, many of the terrific details of scientific management which load an almost superhuman burden upon the executive will be eliminated, and also a great reduction will be made in the number of non-productive workers. Furthermore, the task will cease to be a static thing and become a constantly evolving ideal.

I am suggesting that we can very largely substitute for time study, as a means of prophesying in advance, a system of keeping records of past accomplishments, which will continually reflect actual operating results.

In 1917, at a meeting of the Taylor Society, I made the following observation:[15] "After several years' experience I have come to the conclusion that no matter how skillfully the management determines the one best way, it ceases to be the one best way if the workman does not want to do it that way." Those of you who attended that meeting may remember the comments of Mr. A. J. Portenar, a prominent labor leader, upon that statement.

Mr. Brown's discovery that the Jacques Kahn Mirror Company had no information as to productive possibilities calls to mind an observation made by Mary P. Follett, in her book "Creative Experience,"[16] which I think every executive should read. She says:

> The problem of most managers of industry is how to use the "objective measurements" after they get them; to insure that they will keep as much of their objectivity as possible, and how to make them operative *through,* not in spite of, the will of the workman.

If we only follow this method of measuring what has actually happened, and then see to it that these records, or objective measurements, *keep* their objectivity, so that the workers are constantly conscious of what they are doing, I believe it will be possible largely to eliminate the time study method, as it is ordinarily applied. After all, its legitimate function, from the point of view of predetermination, is scheduling work through the plant.

In a conversation with Mr. Brown yesterday I called his attention to the fact that he did not attempt to install any form of piece work or bonus system, but that all the other elements of modern production control, including adequate time-keeping systems, cost systems, etc., were introduced. I stated to him that I believed the main reason he obtained the cooperation of the labor unions was that he did not insist upon

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[14] From a speech by Herbert Hoover, at Boston, Mass., March 24, 1920.

[15] *Bulletin of the Taylor Society,* Vol. III, No. 2, March, 1917, page 11.

[16] Longmans, Green and Co., 1924, page 20.

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the use of wage incentives. At any rate, the fact that he received the very hearty cooperation of the labor organizations without the use of wage incentives coincides so exactly with my own experience that it makes me believe that there is a very much more fundamental reason for the necessity of eliminating the financial incentive than many managers realize. My own experience in dealing with labor organizations indicates that 100 per cent cooperation can be obtained only when the creative and not the acquisitive motive is appealed to.

When I went to Canada in 1917 to take charge of a group of paper mills there, I found them 100 per cent unionized (although there was not, at that time, a contractual relationship). Shortly after I took charge, a letter was handed to me by the local Committee at one of our plants, which read as follows:

> We, the members of Pulp Sulphite and Paper Mill Workers Union, Local No. ——, after a careful investigation have decided that the cost of living is far in advance of the wage scale, and voted unanimously at a special meeting held the 20th of April to demand a 25 per cent increase in wages, to take effect on May 1st, 1917. Further voted that no able-bodied man shall be paid less than $2.50 per day, whether day or tour worker, as it is impossible for a man to keep a family on less. Further voted that any man after working 15 days if he refuses to become a union man when called on by the Union will have his card removed from the rack, also that our business agent shall have free access to the mill.
>
> An answer to this letter is necessary on or before May 1st, 1917.
>
> We remain, yours in anticipation.
>
> Committee.

You will note that the letter was signed anonymously. The labor organization, not being officially recognized, preferred to keep its officers' names in the dark for fear of discrimination against them. I finally found out who the Committee were and sent for them, explaining to them why a 25 per cent increase was out of the question, by showing them that the extremely small earnings of the previous year would be completely wiped out by such an increase. I went on to say, however, that we did want to increase the wages to the prevailing rates in the industry, but could do so only if the men would earn the increase. This I pointed out meant that they must help us to plan ways and means to improve our manufacturing processes; in other words, we did not want extra physical effort, but more brain work.

In order to bring this about, I explained that "we must follow the scientific method instead of the rule-of-thumb method of doing things." I also explained that there was nothing mysterious or "high-brow" about science; that it simply meant finding out why things went wrong, so as to prevent them from going wrong again, and why they went right once in a while, so that we could make them go right more often.

"When we have the information," I said, "we can use it in one of two ways. We can either tell you what to do, without telling you why—the autocratic way; or we can put the information into your hands so that you can do the correct thing without having to be told—the democratic or Anglo-Saxon way."

They wanted to know how this could be done, so I explained how records of actual manufacturing accomplishments could be made available continuously to those individuals and groups who were responsible and how this always produced joint interest in increased efficiency. Before I had finished, the Grievance Committee became so much interested that I thought I had made a real hit. So I said to them, "I wish you boys would go back to your Local and ask them to appoint a Committee, one man from each department, to talk over the wage question so we can put that behind us. Be sure, however, to tell them what I have said to you about the necessity for earning the increase and also explain why we cannot give a 25 per cent increase in wages at this time."

Then the Committee woke up. The chairman said, "Mr. Wolf, that is a tough job you just put up to us. Do you know what the Local will say if we go back and tell them what you have said and argue in favor of it?"

I said, "No."

"Well, they will say you put one over on us."

I said, "But don't they trust you fellows?"

"Oh, yes, but we can't explain it the same as you can."

I then said, "If that is all there is to it, let me come down and talk to the Local."

So it was arranged. I asked our financial man to go to the meeting with me so that he could give the men the financial picture, for it was not very bright. I, of course, told the men what we were proposing to do, explaining to them what I had previously explained to the Committee. They were very much interested, particularly when I said that we did not want to speed up any one physically, but wanted rather to create conditions where they could help us to plan ways and means for improving our methods of production. The appeal was primarily to their intelligence; not to their emotions. We had similar meetings at two of our plants.

At the second meeting, the National Organizer for the Dominion of Canada was present. He had been discharged for his activities in organizing the Local about two years prior to my coming. After I had finished speaking I called him by name, asking if he were in the room. When he came up, I shook hands with him and congratulated him. He didn't say it, but he looked, "what for?" I said, "Because you have organized this mill 100 per cent and you ought to be proud of it. If you had not done so, it would have been necessary for us to organize a Local through which to deal with our employees. You see, you have saved us all that trouble. Would you mind telling the boys here what you think of our plan, and whether or not your organization, as a Union, could cooperate with us to get the kind of results we have been talking about?"

Of course, he made a speech in favor of the program, for, after all, what a man wants most is a chance to use his planning faculties and this was what we were proposing to give our workers a chance to do.

As a result of this meeting, the men appointed a Committee to dispose of the wage question. After we got that behind us, we began working with our superintendents. As you probably know, the "rule-of-thumb" superintendent is one of the hardest nuts to crack in our industrial life. He is the product of the system, however, so we must not blame him for it. We knew that when we began keeping records of what was actually happening in the plants, they would show up weaknesses in our methods. However, we wanted our superintendents to realize that we could not hold them responsible for what they did not know and that we did not want them in any sense to feel on the defensive when inefficient practices were shown to exist.

After we thought the superintendents were in the proper frame of mind, I sent for Jerry Carey, International President of the Paper Makers' Union. In 1897 Jerry ran a paper machine and I back tended for him. Though he knew that I was a practical paper maker, he was inclined to be suspicious of me because the mill I had operated in New England was known as a non-union mill.

When I explained to Carey that we wanted to begin keeping records of our paper machines, he told me in unmistakable terms that he was opposed to records because they tended to make hard feelings among the men. As he expressed it: "I have seen knock-down, drag-out fights at the end of a shift, because of disputes arising as to who should get credit for a roll of paper coming off the machine at the time the shift changes."

Carey explained that they wanted a spirit of good fellowship and brotherhood among the men and that competitive records of production tended to destroy this feeling. I explained to him that we did not want to install records of this kind, but records of quality. He wanted to know if I meant a recording clock to tell when the paper was off the machines, so that the superintendents could call the machine tender down the next day. I said, "No," and then explained to him just what I meant, showing him a lot of records made from actual operations. Carey listened for about an hour and finally banged his fist on the table and said: "By, George, I'm with you! When you first spoke of records, I did not know you meant records like that. Do you know what that means?"

I said, "What?"

"It means," said Carey, "that the old spirit of craftsmanship will come back into the paper industry. In these big companies a man is fast being made into a machine. The tendency is to have the machine tender run the wet end of the machine and the back tender the dry end; the third hand 'jacks' the rolls out to the finishing room; the fourth hand oils up, and so on. They have specialists come in to sew the wires, change the machine clothing, and do many things that the paper makers ought to know how to do. It is because we want our men to be all around paper makers that we insist upon the members of our organization doing work of this nature instead of having it done by the maintenance crew."

He then pointed out to me that the result of records which stimulate a man's thinking process could not help developing the craftsmanship idea and he wanted to know just what I had in mind. I explained to him that one of the principal difficulties we were having was the varying weight of the paper. I was sure, I told him, that if the machine tender had a continuous record of the weight of the paper as it came off the machine, and if this weight were plotted against an ideal standard line, the machine tender would be just as much interested in having the weight uniform as the management. This meant putting a man on each shift, for every two machines, to take samples from the front, middle and back of the sheet. These weights could then be averaged and given to the machine tender, who did not have time to take so many samples himself. Jerry said it would be necessary to take moisture tests as well, because the sheet might get heavier because it was wetter, or lighter because it was dryer. We then worked out a plan of installing a drying oven at the end of the paper machine, so that the sample tester could weigh the sheet of paper, mark the weight upon the sample, put it into the oven and let it dry out; then weigh it again, and in this way make a moisture determination.

I told Carey how we had previously found it necessary to keep a continuous record of how near the men came to the ideal weight and moisture standards, explaining our conception of a manufacturing plant as primarily an educational institution in which the progress in learning should be measured. This we decided to do by the simple method of calling the ideal weight, which was 32 lbs. per ream, 100 per cent and deducting 20 points for every pound below or above this ideal weight. We also concluded that 8 per cent was the ideal moisture content and called this 100 per cent in the progress record. For every one per cent above or below this figure 20 points were deducted from the ideal 100 per cent standard. The average of the weight and moisture records was the machine tender's record for the day. These records were then to be accumulated on the basis of the monthly average, so that the entire month's work of each machine tender could be made known to him.

The continuous recording of weight and moisture tests for the benefit of the workmen resulted in the elimination of practically all complaints from our customers. Furthermore, the moisture content in the finished paper increased from an average of 6½ per cent to an average of 8 per cent, this item alone resulting in saving in raw materials equivalent to approximately $500 a day. At the same time the quality of the paper was greatly improved.

You will be interested to know that one of the members of the Paper Makers' Union, a machine tender at one of our mills, heard that we had started these records in another mill and asked Carey if this was not some method to "get the drop on the men"? Carey, of course, explained to him that it was all right and that it would be more for the protection of the machine tenders than anything else, because it would enable the management to know how well they are doing their work.

You will also be interested to know that the President of the Pulp, Sulphite & Paper Mill Workers' Union, John P. Burke, when I first discussed this matter with him, told me he did not believe we could make some of the jobs in the pulp mill interesting. The deadly monotony of repetitive work, he felt, had come to stay and the only relief was to shorten the hours by the aid of mechanical devices, so that the workmen could find self-expression outside of his regular occupation. However, after I explained to Burke what we were attempting to do and later demonstrated its practicability, he became convinced that many of the monotonous jobs could be made interesting. I never knew how thoroughly he subscribed to the idea until at a meeting in New York at which I was asked to address the Men's Club of the Ethical Culture Society, he stated that the monotony of work was not an academic theory; that only a man who had actually worked on a job of this kind could know what it was to long for quitting time to come. He then related how the men in one of our mills had heard that we were installing a system of record keeping and came to him to find out if it was all right. He explained that it was and then volunteered the information that I had been a pioneer in putting paper mills onto three shifts, from the long two shift basis, and that now I was proposing to cut the hours from eight to four. The men wanted to know whether he meant six shifts instead of three, to which he replied: "No, but the work will be so interesting it will seem like four."

The fact of the matter is that if we want to increase the compensation of our workers, we must create conditions where they can use their brains in the performance of their work. Wealth is created by a thought process. Therefore, a man who allows someone else to do his thinking for him cannot be worth more than his board and keep. Those who really think are the ones who create real values and it certainly lowers a man's self respect if he is given something he does not earn.

Mr. Johnston in his Silver Bay address, from which Mr. Brown quotes, speaks of the necessity for a larger *yearly* wage, the emphasis not being upon the immediate reward which tends to stimulate selfish separateness, but upon the *real* reward; and while I conceive it to be the highest duty of management to see that men are rewarded in proportion to their accomplishments, I believe it equally important that the money reward always be given in such a way that it does *not* act as a stimulus. Men cannot be actuated by two motives at the same time—there is much sound practical philosophy in the saying that "one cannot serve God and Mammon."

I believe the incompatibility between the trade unions and scientific management, which Hoxie noted, *is* real and not imaginary when the dominant motive which actuates men is what is commonly known as the acquisitive instinct. Cooperation can only be brought about when the creative motive becomes dominant.

In conclusion, I should like to say that there is no question in my own mind that scientific management, if it is thoroughly scientific in recognizing the fundamental human motives, will find organized labor not only willing but anxious to cooperate. The motives appealed to, and the incentive offered by management, however, must be in accordance with the nature of man and so must relate *primarily* to accumulation in the eternal realm of Time rather than in the temporal realm of Space. One of the chief responsibilities of management is to see that the reward is recognized as effect and accomplishment as the cause, and also see to it that the reward is always commensurate with the accomplishment; not only in the things which administer to bodily welfare, but also to those things which administer to growth in intellectual capacity and, therefore, spiritual power.

Hugh Frayne.[17] I wish to congratulate Mr. Brown upon his paper which I have carefully reviewed, and have listened to this evening with great interest. I would like also to congratulate the New York Metropolitan Section of the Taylor Society on their courage and vision in presenting it. It is a constructive document and offers a genuine solution to the labor problem.

The subject of the paper is cooperation between management and organized labor to eliminate the unnecessary wastes of industry. I want to take this opportunity to tell you that thousands upon thousands of union men are cooperating with management every day for the attainment of precisely that object. This cooperation has as one of its fundamental bases complete recognition of trade unionism and of collective bargaining, and I firmly believe that the highest productive efficiency is impossible without such recognition.

I have no doubt that most of you would like me to provide examples of this new kind of cooperation. Well, first we have the Garment Trades, in which the General Executive Boards of the Garment Manufacturers and the United Garment Workers meet at regular intervals to negotiate joint agreements as to the basic minimum wages, piece work prices, hours of work and working conditions which should prevail in the industry under existing economic conditions. These agreements are prepared only after an exhaustive study of all the elements which contribute to the cost of production, and as they are so based, they are fundamentally and economically sound. Then we have the Machinists of the Baltimore and Ohio Railroad, mentioned by Mr. Brown, who for the past two years have been systematically cooperating with the management of that great system in what promises to be one of the most interesting and successful industrial experiments of modern times. These are not isolated cases. A similar spirit of cooperation is finding expression in the cigar industry, the printing industry, the neckwear industry, the building trades and the metal trades. I do not consider it an overstatement to say that this is significant of a great change which is taking place in the minds both of employers and of the unions as to the manner in which our future industrial problems must be approached.

I do not speak from any purely theoretical background. I have been a worker in the ranks and I have served in various executive capacities. I think that I can truthfully state that during many years in the course of which I was in responsible charge of work, I experienced little difficulty in getting efficient results from the men whom from time to time I found under my control. It may not have been efficiency of the stop-watch kind, but it was efficiency nevertheless. As I look back, it seems to me that it was probably due to the fact that I learned early in life that the best results can only be obtained by assuming that the average man wants to work efficiently and will do so quite naturally if treated well and surrounded with the right working conditions. I early learned the value of cooperation, and I want to say out of long experience that when honestly practiced it never fails.

As I go about from day to day, I see on all sides the evidences of a new attitude of good will towards the labor movement, on the part of the employers, and I am also able to discern a change in the minds of workers. An encouraging indication of the latter change is found in labor's strongly awakened interest in the subject of education. We now have our trade union schools, our workers' education bureau and our regular magazines and other publications. I might say, in this connection, that in the New York building trades, employers, unions and the Board of Education are cooperating in the training of apprentices and that the unions are now providing more apprentices than the employers will use. This, let it be observed, is a reversal of the old charge that labor is deliberately creating a scarcity of apprentices throughout the country.

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[17] General Organizer, American Federation of Labor, New York City.

I will take advantage of the fact that I am addressing a technical group to give expression to an idea that I regard as very important. In any approach that you make to workmen, be sure to use language that is comprehensible to them. Many of the technical terms that I have listened to this evening, such, for instance, as "psychology," do little more than create confusion in the minds of most workmen. I am sure that any essential idea may be adequately conveyed in a simple, non-technical way, and if it is connected with work in which the average workman is interested it will be quickly comprehended.

This idea that the average workman, if given the opportunity, is really immensely interested in his work leads me on to another idea which was featured somewhat by Mr. Wolf in his interesting paper. It is this: I think that a shortcoming in most of the recent methods used by engineers for determining the best way in which work should be performed is that they have failed to recognize the fact that the workman also is interested, tremendously interested, in determining for himself the best way in which to work. It is his job that is being investigated, not the employer's job or the engineer's job, and he should be made to feel that he is participating in its creative development. In this way the old pride of craftsmanship can be awakened and preserved and the worker can feel that he is a useful member of society and is making a worthy contribution to the industry in which he is engaged. An outstanding evil which accompanied the transition from handicraft industry to small-scale machine industry and thence to large-scale machine industry was unquestionably the degradation of the workman's job first through the introduction of machines and later through excessive specialization. The problem of counteracting this evil and restoring pride of craftsmanship to the worker is worthy of the serious attention of our best engineers.

While the labor movement requires neither justification nor apology from me, I never lose an opportunity of mentioning in public addresses its more important accomplishments for the working class. I mention them because the general aims of organized labor have in the past been grossly misrepresented by labor's enemies, and also because I have found that such a recital encourages a friendly attitude towards us. Such an attitude obviously must precede any desire to cooperate with the labor movement. What then has organized labor accomplished for the workers of America? It has been successful in securing the eight hour day and forty-four hour week. It has fought to keep labor's wages ahead of the increasing cost of living. It has been largely responsible for the establishment of free public education. It has secured the passage of legislation protecting the lives and health of workers. It has secured the establishment of workmen's compensation laws in the majority of the states. Through its benefit features it has helped the sick and unemployed. It was largely responsible for the passage of the first Free Homestead Law in 1862. It has finally secured the passage of restrictive immigration legislation. It has worked consistently for all measures that would tend to eliminate wars. The American Federation of Labor has consistently opposed violence of every form. It has prevented the spread of the doctrines of the radical I. W. W. in this country. It has consistently fought all attempts of the Bolshevists to get control of American labor.

You will perhaps hear it said that relations within the American Federation of Labor are not harmonious and that there is a more or less constant undercurrent of internal strife going on in the organization. Also you may hear that the unions and individual members are unsatisfied or that the membership is falling away. All these things are said about us. I wish to inform you that there is not a particle of truth in any one of them. Relations both in the Federation and in the organized industries are essentially harmonious; there is a strong spirit of loyalty and solidarity everywhere and as far as the membership is concerned the following figures speak for themselves. In 1886 it was estimated at 150,000; in 1899, 300,000; in 1904, 1,650,000; in 1914, 2,000,000; the total membership is now approximately 4,000,000 and growing. This indicates the consistent manner in which the American Federation of Labor has grown and developed.

I will refer very briefly to the matter of strikes. I do not believe in strikes. I think that a strike is a great misfortune not only to those immediately concerned but in the majority of cases to the general public as well. I believe that every effort should be made to avert strikes, and that they should only be resorted to when all other methods of reaching an agreement have failed. I believe however in the right to strike which is admitted according to our law. The mere fact that this right exists serves to deter a host of unscrupulous employers from imposing unfair and disadvantageous terms upon workmen, where otherwise they would not hesitate to do so. I agree with Mr. Brown that the development of cooperation between management and the labor movement for the elimination of industrial waste will also develop automatically a mighty agency for the elimination of industrial conflict. A satisfactory solution to the entire problem will, in fact, be found only along such lines.

In conclusion let me say that I don't want to see conflict. The new thought among the engineers is safe. The principle of cooperation between labor and management is fundamentally sound and cannot fail to discover a constantly widening field of application. There will be more papers like Mr. Brown's. The trade union movement will go on.

John A. Fitch.[18] The most significant thing about the paper and the discussion this evening is the evidence afforded of open-mindedness and capacity for readjustment in the membership both of the Taylor Society and of organized labor. This sort of meeting could not have been held ten years ago. At that time there was such deep suspicion in each group of the motives of the other as to make conference and cooperation practically impossible. Many of you remember the rather hostile reception given in a Taylor Society meeting in 1915 to a paper by the late Robert G. Valentine on "Efficiency and Consent." At that time also the subject of scientific management was never mentioned in a labor meeting except for purposes of derision. It was this relationship, apparently so firmly entrenched, that led Professor Hoxie to the view mentioned in Mr. Brown's paper.

The changed attitude in both groups that is so clearly indicated by this meeting is the best possible augury of improved relations in the future. The unions, formerly centering all their efforts on distribution and taking no responsibility for production, are now coming to see that they cannot have the one without the other. It is the Machinists' Union, which fought Frederick W. Taylor as no other union did, which now has its own consulting engineer to advise on matters of shop efficiency. The engineers of the Taylor Society, who were equally stiff-necked toward unionism ten years ago, are changing their attitude in an equally significant way. Men like Mr. Brown and Mr. Wolf have proved that Mr. Valentine was right in linking efficiency with consent.

This new attitude does not, by any means, offer a solution of the "labor problem," but it is, to my mind, a social and industrial phenomenon of utmost importance and one that more than any other single thing holds promise of a new and constructive era in industrial relations based upon principles that are both economically and ethically sound.

H. C. Metcalf.[19] Mr. Brown's paper is a real contribution to the growing body of literature that is helping us take a constructive view of the hitherto regarded "inevitable conflict between employers and workers." I am in thorough accord with the central theme of the paper, viz., "that these old beliefs are rapidly becoming obsolete and that the logic of events is throwing into constant relief the fact that the troublesome problems in our human industrial relations may be adequately solved only by development and exercise of this same principle of cooperation."

The common interests of employers, workers, and society, according to the general conceptions of scientific management, are protected through (1) the elimination of wastes (material, time, energy); (2) improvements in processes and methods of production; and (3) just and scientific distribution of product. According to my understanding of the basic principles of scientific management, Taylor taught that there is a fundamental harmony of interests between employers and workers; that high productivity, high general wages, good working conditions and low labor cost constitute a good working quartet; that militant force and subjective opinion must yield to fact and scientific truth; and that "a code of natural laws equally binds employer and workmen"—by all of which Taylor meant genuine cooperation.

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[18] Director, Industrial Courses, The New York School of Social Work.

[19] Director, Bureau of Personnel Administration, New York City.

The employer-employee get-together movement, so encouragingly revealed by Mr. Brown's evidence of the willingness of organized labor and management to cooperate on the vital problems of eliminating waste in industry, is a natural by-product of the newer conception of the employer-employee relation. The fine spirit of cooperation, which is the surest test of progress, regards the old traditional conflict between employers and workers not as *inherent* in the work relations, but as an opportunity for constructive integration of the hitherto supposedly divergent aims of those who function in industry.

It was my privilege a year ago to read the 372 essays submitted in the *Railway Age* contest for "the best methods for bringing about cooperation between railways and their employees to promote efficiency"—the central theme of Mr. Brown's paper. Our railways are among our most highly unionized industries. I was greatly impressed and heartened in going over these essays to note the eagerness on the part of the writers (from all ranks of railway workers) to be "let in on" the vital and interesting problems outside routine duties. Many constructive suggestions looking toward the development of a genuine cooperation are revealed in these essays. The invitation of Mr. Lee to the Railway Executives and Brotherhood leaders to convene in Conference at Cleveland, the 29th of this month, "to find the right way" to cooperate is further evidence of the readiness of organized labor to assume a greater degree of responsibility for the success of the industry of which it is a part.

The same fundamental desire to create wholesome employer-employee relations is revealed in the best aspects of the employee representation movement.

There is no more wholesome tendency in our economic life today than the emancipation from many of the earlier doubts, suspicions, misgivings, ulterior and secretive motives on the part of both employers and workers. All this is now gradually giving way to a wholesome, constructive, mutual confidence and respect. This growing emancipation is in large measure due to the fact that this get-together movement has allied itself with the scientific method. As I have said elsewhere: "Science is a great solvent of prejudice and misunderstanding. Cooperation is being understood more and more as a growth . . . . Emphasis is being placed upon methods and means, not ends. Questions of constitutional form occupy less time and energy, and methods and technique of smooth, effective operation are emphasized." There is a conscious growing conviction that the proper and true relationship between employers and workers is not one of continual strife, but one with an underlying foundation of harmony, mutual respect and accord. Such a relationship is conceived and developed on the basis of mutual faith, facts scientifically established and a keen sense of the square deal.

De Tocqueville, the master mind of democracy, tells us that "whatever exertion may be made, no true power can be founded among men which does not depend upon the free union of their inclinations." Is not this the essence of cooperation? Does it not mean that reliance upon power, force, secrecy, hero worship, autocratic method must give way to open double-track channels for the free flow of facts, knowledge, hopes, aspirations, wisdom? Does it not mean that if we are to have true efficiency and harmony in the employer-employee relations, managers and workers, or their representatives, must exercise, not superior force but a *right;* that authority must rest upon proved worth and wisdom; that obedience must increasingly be rendered, not to a *man* but to improved industrial law and to justice? And will not the problems of production—waste elimination and all the rest—be most constructively observed, analyzed, interpreted and most safely directed along cooperative lines at the points *where they arise and by those whom they most directly affect?*

Industry is crying out for a more conscious, deliberate, jointly responsible, thoroughly scientific attitude on the part of all its participants. We need new inventions, new solvent concepts, a cooperative industrial statesmanship to lead us into the abiding conviction that conflict is a life-giving creative opportunity. The time has come to inform, instruct, stimulate, teach *principles,* not fixed rules; make industry an "adventure in creative enterprise"; put vital meaning into work; make it scientific, pro-social and *human;* keep the work relations in harmony with fundamental, *individual* life needs, and protect ascending social standards; trust men and encourage them to manage themselves; aim to realize in industry the ideals of self government; and remember that the core of constructive cooperation is an honest *redistribution* of men—a fair chance to make personality count.

Spencer Miller, Jr.[20] There is one aspect of Mr. Brown's paper on "Scientific Management and Organized Labor Today" that I should like to stress. It is the social significance of the new policy of cooperation between management and labor to which he refers both in his own experience at the Jacques Kahn Mirror Co., Inc., and in that highly important cooperative experiment of the Baltimore and Ohio Railroad. In the case of the B. & O. plan one sees abundant evidence of the shift in position from educating men for production to a position of drawing forth the educational possibilities of production itself. Cooperation thus conceived becomes more than an administrative technique to reconcile differences: it becomes a dynamic example of reciprocal education to both management and men. Psychologically the shift is from the position of "they" to "we." Both groups become consciously participants in the process as well as in the results of production. Just such creative activity with real problems is the fulfillment of an elementary pedagogical principle that men learn by doing.

The resistance of labor to scientific management in the past was due in the last analysis to the denial of the very cultural and educational opportunities that seem to be inherent in the B. & O. plan. There was a genuine fear that under scientific management, if generally applied, "the craftsman," in the words of Mr. John P. Frey, "would pass out of existence, and the workers would become dependent for their existence upon the scanty and insignificant industrial knowledge and experience afforded them by their limited opportunities, regulated by those who, in addition to ownership of machinery, had also acquired possession of craft knowledge and the skilled workers' methods."

Contrast this attitude of labor as ably set forth by Mr. Frey with that on the B. & O., where workers became not only responsible for the efficiency of the shops but jointly for the morale and efficiency of the entire railroad. As a well conceived program of training for citizenship in industry, nothing could be more illuminating than these new developments that Mr. Brown presents.

And it must necessarily follow that when such organic partnership has been effected, the scientific organization of business will result not because labor is "unable to stop its progress" but because labor recognizes the immense cultural and educational product that comes to both labor and management when both join to bring science to the service of business and both to the service of the community.

Noel Sargent.[21] Both the main paper and the discussions which have followed have been exceedingly interesting and, in addition, provide many points upon which it is evident there is great agreement. I propose to inject a few points upon which some disagreement or doubt may be felt.

Remarks of Mr. Frayne, in particular, present many questions to which several hours of discussion could be profitably devoted. For example, his statement that the highest efficiency existing in industry today is found in those industries which are operated under predominantly closed shop conditions (which is meant by his references to union agreements) could, I am sure, be seriously disputed. It is significant and much more than a coincidence that the three American industries in which prices have increased most during the past eleven years have been those industries which, to the largest extent, have been dominated directly or indirectly by closed shop production methods insisted upon by organized labor. I refer to the coal, clothing and building material industries of this country. If, as has been asserted here tonight, union agreements resulted in great efficiency, the operating costs in these industries should have been lowest and prices should have increased least.

There could, moreover, be a serious and perhaps worth-while discussion as to what collective bargaining is and whether any form of organization can justly claim to have a monopoly upon the type of collective bargaining which should exist in industry.

In common with the President of his organization, Mr. Green, Mr. Frayne describes at length a wonderful picture as to harmony in industry which exists when union agreements are entered into.

I am reminded that recently, I believe at Harvard University, the President of the American Federation of Labor spoke of the wonderful peace existing in closed shop industries and that the following day 22 million dollars of construction work was tied up in New York, Philadelphia and Chicago because of a jurisdictional dispute between rival unions, regardless of the fact that the employers involved were perfectly willing to employ only union workers and to employ them under union conditions.

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[20] Secretary, Workers' Education Bureau of America, New York City.

[21] Secretary, Employment Relations Committee, National Association of Manufacturers, New York.

It should, moreover, be recalled that the experience in England, where closed shop conditions prevail to a much larger extent than in this country, has not been such as to justify a belief that the general prevalence of unionism or closed shop agreements in American industry would conduce to national prosperity. If time permitted evidence could be introduced to demonstrate conclusively the disastrous result on British trade and prosperity of the closed shop conditions in her industries.

We have had reference here tonight to the necessity of rigid observance of contracts in industry and to this I fully agree. It may be pointed out, however, that while the American Federation of Labor at one time demanded that unions should be allowed to incorporate they now oppose vigorously any proposals for incorporation and any other proposals to make the unions which sign contracts responsible for their observance. We may even point out that the late president of the American Federation of Labor, Mr. Gompers, in his testimony before the Lockwood Committee declared that employers should be compelled to observe contracts they sign with labor organizations but that the latter should not be compelled to abide by them strictly.

Explanations or professions as to the willingness of organized labor to use or rather to permit the use of so-called scientific management in industry will continue to be taken "cum grano salis" by most of the manufacturers of the country. The reasons for this doubt I shall briefly set forth.

In private industry the record is, on the whole, one of dislike by organized labor of any form of "scientific" management; many people, both employees and employers, it may be remarked, at the present time "shy" at any suggestions of "scientific" or "efficiency" schemes or proposals. In the first place, it should be noted that really "scientific" management implies the most economic use, with the least waste, of the labor, machinery, and materials available, including within this the elimination or prevention of health-impairing methods or practices. That is to say, management of a truly "scientific" character embraces, as we all realize, much more than studies of the best methods of using available labor or of the best tools to use.

Plans, systems, devices, or rules, written or unwritten, impairing or impeding the efficiency of management increase operating costs, which President Green of the A. F. of L. assures us are passed on to the consumer, and are in their results most unscientific and wasteful.

I am well aware that Mr. Gompers declared for public consumption in 1921[22] "Trade-unionism . . . rejects wholly the false doctrine of restriction of output as a means of helping the worker." Yet I submit that the evidence does not at all show that it "rejects wholly" either that doctrine or other practices of "unscientific" production.

Particularly in Illinois and Indiana the United Mine Workers prevent where possible, or at least delay as long as possible, the use of loading machinery in coal mines.

The International Typographical Union has a number of obnoxious and unscientific rules. It provides, for example[23]

> The interchanging, exchanging, borrowing, lending, or buying of matter previously used, either in the form of type or matrices, between newspapers, between job-offices, or between newspapers and job-offices, or vice versa, not owned by the same individual, firm or corporation, and published in the same establishment, is unlawful, and shall not be allowed, unless such type or matrices are reset as nearly like the original as possible, made up, read and corrected and a proof submitted to the chairman of the office. Transfer of matter between a newspaper office and a job-office, or a job-office and a newspaper office, where conducted as separate institutions, and from separate composing rooms, owned by the same individual, firm or corporation, is not permissible unless such matter is reset.

The International Association of Machinists provides[24]

> In shops where it is not now a practice no member of this Association shall be permitted to accept piecework or accept work under the following conditions: operation of more than one machine, piecework, premium, merit, task or contract systems . . . . Where these systems are established they shall be entirely abolished as soon as possible, date to be set by the General Executive Board.

To a New York audience it is not necessary to recall the large number of methods uncovered by the Lockwood Committee which are used in the building trades to increase production costs.

In the garment trades, in certain centers, it is true, the unions appear to have made some efforts to join with employers in basing wages on efficiency. Yet this is coupled with other practices which restrict the managerial functions in industry and, as in Cleveland, have driven out of existence a large part of the business. In New York city it is now provided in the ladies garment industry that plants cannot even exist under union contracts unless they can afford to operate a minimum number of machines—an attempt to dictate the minimum amount of capital which shall be used.

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[22] "Union Labor and the Enlightened Employer," *Industrial Management,* Vol. 61, No. 7, April, 1921, pages 234-9.

[23] Laws, page 93.

[24] Constitution, page 71.

Now let us consider an even clearer instance of opposition to "science" or "efficiency" in industry—and one about which we can do something.

The present Appropriation Acts for the support of the Navy and War Departments for the fiscal year ending June 30, 1926, carry riders denying pay to any officer, manager, superintendent, foreman or other person having charge of the work of any United States employee who makes or causes to be made "with a stop watch or other time-measuring device a time study of any job of any such employee between the starting and completion thereof, or the movements of any such employee while engaged upon such work." The rider also forbids the payment of any premium, bonus or cash reward to any employee in addition to his regular wages except for suggestions resulting in improvements or economy in the operation of any government plant.

There we have the real—not a professed—attitude of organized labor towards scientific management in bills preventing extra pay for extra efficiency and preventing studies as to the most economical ways of performing work. These bills have for years been enacted at the request of organized labor.

The same bills specifically provide for construction, repairs, and maintenance in government navy yards to the value of at least $88,000,000, and indirectly provide for far larger amounts—and upon all this work "scientific" management is prohibited at the request and demand of organized labor. It goes without saying that on Government work, supported by the taxpayers, work should be done as economically as possible.

You are, of course, aware that formerly time studies and bonuses were permitted on government work. At the Watertown Arsenal following their installation workers produced from two to two and one-half times as much work in a day as before, and received increased compensation. The 1912 report of the Chief of Ordnance to the Secretary of War relates "the benefits which accrue to the workman from the Taylor system as applied at the Watertown Arsenal" and also the advantages "secured for the Government."[25] Acts of 1915 and 1916 prevented the continuance of these practices.

It is economically wrong and politically outrageous that efficiency in government work should be so interfered with at the expense of the taxpayers—and at the demand of a comparatively small group. Why should Government plants be denied those aids to efficient production indispensable to the progress of private manufacture?

Will organized labor join in an effort to oppose such anti-efficiency riders at the next session of Congress? Unless they do so what shall be said of the attitude of organized labor towards scientific management?

Closure

Geoffrey C. Brown. Mr. Sargent has introduced a few points to which, in closure, I will give brief attention.

He states that "there could be a serious and perhaps worth-while discussion as to what collective bargaining is, and whether any form of organization can justly claim to have a monopoly upon the type of collective bargaining that should exist in industry." I agree with Mr. Sargent that such a discussion—impartially conducted and with a fair representation from the labor movement which has been responsible, directly or indirectly, for the entire development of collective bargaining—would be both interesting and instructive. President Johnston of the Machinists' Union, at the last Silver Bay conference of the Y. M. C. A., in reply to Mr. J. Parke Channing, gave the following quite adequate definition of collective bargaining.

> Briefly, you have collective bargaining when the workers are organized and recognized as having a right to a voice in determining the wages, the hours, and the conditions under which they shall work, and when they may sit down with the employer and negotiate a standard or working agreement.

It is interesting to trace the gradual evolution during the past fifty years of the attitude of industry toward collective bargaining. Fifty years ago, to quote an eminent economist, "the old-fashioned employer would no more have dreamed of negotiating with a Trade Union official claiming to represent the work people than he would have recognized a representative of his horses.[26] Twenty-five years ago the term "collective bargaining" was still anathema to the majority of employers. Since then, and most notably during the past decade, the right of workmen to maintain their own organizations and to bargain collectively has had a constantly widening field of recognition, has been confirmed by courts of justice, and has been publicly affirmed by three Presidents[27] of the United States. Progress seems to point toward ultimate general recognition of the unions and of collective bargaining.

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[25] Page 17.

Mr. Sargent questions certain statements made recently by President Green of the American Federation of Labor, before the Harvard Union, and by Mr. Frayne this evening as to "the wonderful harmony existing when union agreements are entered into." He draws attention to the fact that a large amount of construction work throughout the country was recently tied up owing to jurisdictional disputes between rival unions. It must be quickly admitted that disagreements within the unions have been an expensive nuisance. As the American Federation of Labor develops and adjusts its vast organization, however, these internal disputes grow rarer year by year. When we consider that the Federation now comprises 108 great national or international unions, representing 36,000 local unions and about 4,000,000 workers, it is evident, despite Mr. Sargent's example of internal discord and other examples that I might cite, that remarkable harmony has been maintained. Mr. Gompers was very proud of the record of American Labor in this respect.

It would be difficult to imagine a more untenable position than that assumed by Mr. Sargent when he declares that the experience of England, where the labor movement has had its most conspicuous growth, demonstrates conclusively the disastrous effect of trade union conditions in her industries on trade and prosperity. Until the war England was—for many years had been—generally prosperous. During this period, the British labor movement was successful in lifting the industrial masses out of the deplorable nineteenth century conditions described by Carlyle in "Past and Present"[28] into conditions which were also reasonably prosperous, although not comparable, perhaps, to the conditions enjoyed by American workers. It is important to note that British labor did this without economic injury to British industry. Labor leaders in England are among the first to admit that some past ideals of the movement have been mistaken and that there have been unwise practices on the part of labor in its effort to learn cooperation and better its condition. These practices have, however, been largely due to obstacles, raised by management, to the betterment of labor's condition. During the war British labor cooperated in the fullest way with British industry in the manufacture of munitions and other war material, even to the length of abandoning agreements which it had fought for and established for its own protection. Since the war England has been in an adverse condition economically. This, however, is due to maladjustment of world economic relationships and not at all because of the existence or activities of the British labor movement. I have heard of cases in England where organized labor is working shoulder to shoulder with employers in just such efforts to increase productivity as the American example which I have described tonight.

Mr. Sargent next draws attention to the fact that while the American Federation of Labor at one time demanded that unions should be allowed to incorporate, it now opposes vigorously any proposals for incorporation. The reason for this change in front is, I believe, that the unions know that if they were incorporated, interminable lawsuits would tie up union funds when they were most needed to pay strike benefits. Because they are not incorporated, it becomes necessary to sue every member separately, a very arduous proceeding from the employer's standpoint. It should be stated that the American Federation of Labor constantly urges upon its members that agreements should be faithfully observed.

Concerning Mr. Sargent's next statement that the manufacturers of the country will continue to take

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[26] Sidney Webb on "Recognition of Trade Unionism" in "The Works Manager Today," Longmans, 1917, page 35.

[27] Presidents Wilson, Harding and Coolidge.

[28] See also Arnold Toynbee's "The Industrial Revolution" for an account of the long hours, low wages and horrible conditions which were a part of the average worker's life in England during the first half of the nineteenth century. It is generally recognized that the measure of prosperity attained since then has been due to economic protection afforded by the British labor movement. A recent book, "Everyday Problems of American Democracy," by Greenan and Meredith (Houghton Mifflin, 1924) says, page 455, "The labor union has been the greatest single factor in lifting the worker out of a life of endless toil and misery to one of real human existence. In order to test the truth of this statement, it is only necessary to contrast conditions before and since the establishment of organized labor, or to contrast the life of the average person today in those countries in which labor is organized, with those in which it is not."

"cum grano salis" any profession as to the willingness of labor to permit the use of "so-called" scientific management, it is evident that he recognizes two sorts of scientific management—the "truly" and "so-called" varieties. To quote again from his discussion. "In the first place, it should be noted that *really* scientific management implies the most economic use, with the least waste, of the labor, machinery and materials, including within this the elimination or prevention of health-impairing methods or practices. That is to say, management of a *truly* 'scientific' nature embraces, as we all realize, much more than studies of the best methods of using available labor or of the best tools to use." Scientific management to me comprises all the elements that Mr. Sargent includes in "truly" scientific management, and a number of others, such as utilization of the findings of experimental psychology as fast as these accumulate, the recognition and development of industrial democracy, and cooperation with the labor movement. And I will venture a prediction that neither the manufacturers of the country nor the labor movement will continue indefinitely to take this kind of scientific management with Mr. Sargent's classic grain of salt.

Mr. Sargent next quotes the late Mr. Gompers to the effect that "Trade Unionism rejects wholly the false doctrine of restriction of output as a means of helping the worker," and then devotes the balance of his discussion to a citation of instances proving that certain of the unions still insist on such restrictions and are still actively opposing progressive methods of production. This part of Mr. Sargent's discussion convinces me that he has totally misunderstood both the contents and purpose of my paper. In an early paragraph I carefully affirmed antagonism on the part of the unions to progressive management methods and then introduced what I believe to be conclusive evidence that this attitude of antagonism is rapidly disappearing, and that organized labor is moving toward a new policy of cooperation with management in a warfare on waste. Mr. Sargent apparently accepts only the antagonism. My paper was designed to show *first,* the great desirability of such cooperation; *second,* that there is in fact no fundamental incompatibility between the ideals of prevailing trade unionism and scientific management, and *third,* that when the cooperation of a union is invited by management, in all sincerity and with cordial recognition of the right of the workers both to their organization and to collective bargaining, this cooperation is obtainable. Mr. Sargent does not allude to any one of these three major ideas.

I would now like, in the friendliest way, to inform Mr. Sargent that I have discovered by actual experience in union shops that getting along with organized workmen and securing their cooperation is very largely a matter of the spirit. If a truculent attitude of non-recognition and refusal to deal with the union is assumed by management, the response, "as in a mirror face to face," will be in kind. If on the other hand a friendly approach is employed, based on full recognition of the right of workmen to organize for their own protection, the response will also be in kind, and to quote from Mr. William Green's letter reproduced earlier, "the way is then opened for practically limitless opportunity for cooperation between management and employees for the development of more efficient practices and processes."

APROPOS of the subject matter of the preceding article, the reader's attention is called to the review by John A. Fitch of Copley's "Frederick W. Taylor," reprinted by permission from the Machinists' Monthly Journal, on page 171, and to the reviews of "The Women's Garment Workers: A History of the International Ladies Garment Workers' Union" by Louis Levine, "Employees Representation in Coal Mines" by Ben M. Selekman and Mary Van Kleeck, and "Sharing Management with the Workers," by Ben M. Selekman in the review section, pages 175 to 180.

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Experimental Psychology in Personnel Problems[1]

Emphasizing the Need of Additional Quantitative Analysis in Such Problems as Learning Curve and Wages, Individual Differences, Employment and Turnover

By C. S. YOAKUM[2]
Professor of Personnel Management, The University of Michigan

A FELT difficulty consciously observed is the beginning of thought. More often, we are told by the historians of our science, events that might result in epoch-making discoveries arise to the level of felt difficulties and then sink without stimulating thinking. They pass by us without our realization of their importance. Unless we are artistically tempered, most of our observations of activities and phenomena disappear without analysis in this manner. It requires the artistically minded to see that all occurrences have meaning; that there is picturesqueness in them; that thinking about occurrences in some peculiar manner gives new and satisfying meanings to what were previously merely happenings. The artistically minded and the orderly minded blended in the same person gives us the scientist. To him we look for new insights and for explanations as well.

Popular psychology is well filled with examples of theories developed by one or the other of these types of mind. Phrenology, astrology, the unconscious, the censor, are artistic conceptions with little or none of the scientific intermingled. Our purely orderly minded persons develop complicated methods of wage payment, wonderfully wrought-out welfare plans, detailed regulations and laws, and complex training methods, which bear no relation to an artistic whole or to the human being to be benefited. We have recently been well supplied with answers to the question, "What does the worker want?" These answers have been "artistically" conceived, or "scientifically" wrought out. Few answers have had the two characteristics combined.

No serious cause for action can lie against those who have sought these answers in separate ways. Even to be able to ask the question, "What's on the worker's mind?" is an advance over great thinkers of other days. In 1675, Malebranche wrote that the total heterogeneity of the two substances, body and mind, did not permit direct knowledge of body by mind. Earlier, Geulincx had written that the mind cannot cause bodily movements; no one knows how he sets to work even to raise his arm. In 1781, Kant held that any science of nature was possible "only so far as we can employ mathematics; he specifically excluded psychology and chemistry from the natural sciences as being merely descriptive disciplines."[3] Chemistry has long since taken its place among the natural sciences. We may, therefore, hopefully look forward to the time when the problems of selecting, working with and influencing men are no longer merely intuitive arts but are skillfully done because of successfully combined art and science.

To the unreflecting mind the desire for numerical orderliness and the "artistic touch" have always seemed to arise from different sources. It has been easier to say that the characteristics of man's behavior are infinite in variety than to enumerate and hold fast, for experimental purposes, to a few of them. From the viewpoint of the artistic unity, Taylor grasped the basic principle when he said in his lecture at Harvard, "The working man and the college professor have fundamentally the same feelings, the same motives, the same ambitions, the same failings, the same virtues."[4] Such a principle does not permit us to put the question, "What does labor want?" for it recognizes two fallacies in the question at once: first, the substitution of an abstract term for living persons; second, the assumption that these people are different from others presumably not included in the class.

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[1] A paper presented at a meeting of the Taylor Society in Ann Arbor, Michigan, May 16, 1925.

[2] Author of "Army Mental Tests" (with Robert M. Yerkes) and "The Selection and Training of Salesmen" (with H. G. Kenagy).

[3] Windelband, Wilhelm, "History of Philosophy" (Translated by James Hayden Tufts), Macmillan, 1901, page 546.

[4] Copley, F. B., "Frederick W. Taylor," Harper, 1923, Vol. I, page 188.

It is not enough to recognize essential similarities among humans. After a struggle with his men, Taylor, reporting it in his testimony before the Industrial Relations Commission, said: "The main trouble with this thing is that you have been quarreling because there have been no proper standards for a day's work. . . . We make a bluff at it and the other side makes a guess at it; then we fight."[5] He not only felt the urge that makes us kin, but also analyzed this urge into its dynamic factors. The scientific spirit led him to investigate, to think, and finally to know. When something is wrong, it is the artist in us that feels the wrong. When a complicated situation that is wrong is righted, it is due to the clear and penetrating vision of the courageous investigator who reveals the cause of the wrong.

This problem has been set us: to feel artistically and justly; to search methodically until the factors that hinder feeling are found and adjusted. Doubtless all of us feel there are specific difficulties sufficiently numerous to engage the attention of all scientifically minded men. One quotation will suffice to apply more concretely the two thoughts I have thus far had in mind.

S. N. D. North in section V of his address "Seventy-five Years of Progress in Statistics, 1839-1914," says:[6]

> I have reserved reference to industrial statistics, because they are *sui generis*. They are the touchstone of the new social era upon the outskirts of which we are hovering. . . . There is no more difficult statistical field, and none more important. The Census Office, in dealing with manufactures, has been appalled by the wage problems of the day rate, the weekly rate, the piece-price rate, often utilized side by side in the same mill—a problem in which every separate occupation in every industry may represent a different wage, in which the degree of non-employment varies constantly; in which a thousand factors enter to invalidate conclusions as to the average number of employes in a given industry, the average earning, and the actual relative share of employer and employe in the increment of industry. It is the most intricate riddle which confronts statistician and economist. Colonel Wright once remarked that "we cannot get at it by any scientific method." The answer is, that the method must be found; for the live wire of today leads into the heart of these questions.
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> And lo, the solution is at hand; for the statistician has appeared, and behind him is an educated public opinion, which demands that equity shall be the basis of compromise, and trusts the statistician to prove mathematically where equity lies.

II

The struggle to introduce quantitative analysis into psychology has been a long one. I have referred above to one eighteenth century attitude toward the problem. At almost the same time, 1776, Eberhardt wrote that "the comparison of the values of images according to the degree of clearness leads to a mathematics of the soul. In the comparison of sensations with each other the unit measurement would have to be an unnoticed image which, of course, would be useless for this purpose just because it is unnoticed." In 1760, Lambert[7] showed that this unnoticeable difference, in the field of photometry, mathematically differed but slightly from the "just noticeable difference" in brightness. Bernoulli in 1738 formulated the vague but interesting principle that the value of external possessions is to be measured by the increase which accrues to the possessor. Almost one hundred years later, in 1834, Weber formulated his law "that the recognition of the just noticeable difference is dependent entirely upon the relation of the difference to the total value."

Let the orator in the midst of a polished peroration use the colloquialism "ain't," and it strikes us with a force all out of proportion to its size or volume of sound. The quarrel between painter and plasterer as to which shall "shoot" cement on the walls of our house seems trivial in comparison with the completion of our home. The introduction of piece-rate payment frightened the employer when he calculated the money payments to be made under the new method; cutting the rate, limiting the raw material supply, shifting the extremely rapid workers to other tasks aroused a "noticeable" difference in the worker's mind and "loafing on the job" or "systematic soldiering" became a recognized though temporarily unexplainable phenomenon.

The extension and elaboration as well as the naming of Weber's law are the work of Fechner. He developed the principle and formulated the mathematical rules describing it. Since then it has been applied in various ways in the field of psychology and its theoretical aspects have even tempted the economist. Observations consonant with this generalization are often made, as I have indicated above, but the painstaking work necessary to test the assumptions are avoided. Titchener calls attention to the great significance of the law in daily life. We are slowly beginning to realize that triviality and importance of events are not measured by the absolute magnitudes of the events but by the more specific relationships they bear to our appreciation of them. Satisfaction with wages, hours, working conditions within the middle ranges, to paraphrase the limitations set to Weber's law, are more dependent on what the other fellow gets, how long he works, and where he works than upon any direct understanding of the actual differences in amount of or method of payment.

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[5] Op. cit., page 216.

[6] "The History of Statistics," John Koren, Editor, Macmillan, 1910, pages 39-40.

[7] Klemn, Otto, "A History of Psychology," (translated by Emil Karl Wilm and Rudolph Pintner), Scribner, 1914, page 234.

In 1795, the astronomer in charge of the Greenwich Observatory noticed that an assistant whose error in recording stellar transits had previously been a half second, had now increased that error to almost a whole second. The error became the topic of much discussion and almost one hundred years later became the leading problem of psychological [illegible]estigation. The refinements of method, the insight gained into behavior, and the importance of the results where minute time periods are a factor need not detain us here. We may nevertheless note in passing that one hundred and thirty years later we have come full cycle and the problem of the "personal equation" is once more a practical one. The driver of an automobile who cannot shift his foot from accelerator to brake in fity-two hundredths of a second or thereabouts will be denied his license as was the assistant astronomer years ago. He is offered one alternative unknown in earlier days, to improve by practice where he will not endanger others, according to a learning curve that bristles with mathematics sufficiently detailed to satisfy the most fastidious.[8] This "personal equation" has been the factor in thousands of cases of turnover and the cause of unmeasured amounts of unhappiness and friction.

If time permitted it would be interesting to trace historically the growing significance of mental testing, of the psychologist's studies of the emotions, and of the still more recent attempts at quantification in the field of human personalities. We are not only confident that the ghost of the fallacy that psychology cannot become a practical science is rapidly being laid; but also that its shadow is materializing into real substance and form for those who still call knowledge intuition and experience. We have tried to show above that "intuition and experience" are but elementary and crude efforts at artistic explanation.

III

In 1897, Bryan and Harter published their studies of learning. In this report they showed what are now generally known features of the learning curve, such as the early steepness of the curve, its flatter portion, and the later steep portion where skill becomes expertness. Since then many studies have appeared on different types of learning, of learning by different processes, of learning with or without knowledge, and of the effects of different incentives, distractions, etc. My attention has recently been called to these facts again by a statement made in a series of articles on "Management in the Woodworking Industry," by Carle M. Bigelow. He seems to have rediscovered these earlier facts in his studies of acquirement of skill in this industry. He has sought to apply this rediscovery by a special modification of his method of paying wages. The modification consists primarily in a steadier rise in the wage scale than is warranted by the shape of the learning curve.

> We believe that we have discovered an absolute fact that with the average worker when he or she has covered about one-half normal training period, there must be expected a period of time, depending upon nature of work, when progress or increase in skill practically ceases. Then, after a short while, he attains balance of average proficiency very rapidly. Especially in plants employing female labor, the loss of operatives before they become fairly efficient workers is a serious problem and we believe largely due to the fact that their remuneration is based upon a required constant increase in proficiency which is practically impossible for the average worker to maintain.[9]

Noting as a general preliminary reservation that the acquirement of skill depends on the materials and operations involved, let us look at some of the implications in the above observation. In the first place we may note that later studies do not seem to indicate the plateau as an essential part of the learning curve.[10] "As long as a learner maintains a high degree of attention and puts forth maximum effort, he continues to improve till he reaches his limit. . . . The ordinary learner usually does his best for a time, then because of fatigue, or lack of attention, or loss of interest, he relaxes and works at a lower point of efficiency."[11] Again assuming for the moment that in the woodworking industry we are dealing with types of acquirement of skill that follow the simpler laws of learning, we see that an increase in wages, at the plateau stage, theoretically at least, is more likely to fixate the sensations of fatigue, or habits of lack of attention than to stimulate toward an elimination or shortening of the plateau. If examination should show that loss of interest is the factor, we are again confronted with a similar question. Should payment continue to increase while the interest of the worker is temporarily busied with surroundings not yet adjusted to?

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[10] Book, W. F., "The Psychology of Skill with Special Reference to Its Acquisition in Typewriting," The University of Montana, Missoula, 1908.

The application of another type of incentive should be considered at the beginning of the plateau of the curve. "There is in every workroom a fashion, a habit of work, and the new worker follows that fashion, for it isn't respectable not to. . . . . Our chart shows that the stronger the sentiment in favor of industry is, the harder the new member tries and the sooner he succeeds."[12] After a certain familiarity and degree of mastery are attained the worker begins to look about him, to observe how others are working, how they act, and who they are. According to this view the wage phase of the incentive if used should be applied to those in the department who are most skilled and the beginners who are in the plateau stage should then be furnished with data showing how profitable it is to reach high skill. Previous to this stage to know about highest possible production might conceivably be a discouragement rather than an incentive. For those who prefer to keep all incentives in terms of wages, it is, therefore, the wages paid others, not the direct wage, that is the incentive.

We are not, however, directly concerned with wage incentives. Let us take the case quoted by Douglas. The management found their product was losing in consumer demand. They laid off one-half the force. Production remained the same or better. Again they laid off men. Still the production failed to fall. In another instance, where special effort over a two year period had reduced waste and spoiled parts one-half, the management announced that until times were better they would shut down the plant as soon as the present stock of raw materials was worked up. Waste fell 75 per cent below the existing level. Mere mention need be made of Wolf's experiences with non-financial incentives in this connection.

What about the learning curve? Both of these illustrations seriously modify that curve, if production be the measure. Neither of the changes in the curve just cited was produced by task and bonus, or premium or piece rate, or any other method of payment. You may say, these illustrations do not apply to the first plateau. Perhaps so, perhaps not. They certainly apply to later plateaus which are equally important.

Let me recall at this point some further data on the learning curve. We have not drawn the complete curve until we know the relation between speed of reaction and the limits of the machine, if it be a machine operation. If the machine can be operated more rapidly than the most rapid human reaction necessary to tend it, we can then find the human limits of speed and skill. Under other conditions, we cannot. Turning to the human side of the equation, Fernald's endurance or will test illustrates vividly the possible congeries of factors operating. The test is simple; to stand on one's toes until it is impossible to stand in that manner any longer. Though not a natural position, there seems to be no short physiological limit beyond which one cannot go. The subjects when they quit usually said, "Oh, I just quit," or "I decided I had stood long enough," or merely, "What's the use?"

Here is where a rough generalization of Weber's law recurs to us. The decreasing value of the stimulus due to adaptation, habituation, fatigue, or change of interest reaches a point where the ratio between stimulus and mental process no longer gives the just noticeable difference necessary for a rising or even level learning curve. The introduction of other stimuli, incentives if you will, or decreasing effect of these may again raise this ratio to its standard fraction.

Note that I am not advocating continuous work at the peak. Stephen Leacock tells of the calculation whereby the addition of two, four, etc., ounces of food would cause a hen finally to lay 20 eggs per week. His partner, enthusiastic over the possibilities, suggested they start at once feeding the hen 16 ounces per day. He adds: "I had to remind her laughingly that at 8 ounces a day the fellow would probably be working up to capacity, and carrying what we call in business his peak load. The essential factor in business is to load up to the peak and stay there."

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[11] Pyle, W. H., "The Psychology of Learning," Warwick and York, 1921, page 32.

[12] Gantt, H. L., "Work, Wages, and Profits." The Engineering Magazine Co., 1919, page 186.

great significance of the law in daily life. We are slowly beginning to realize that triviality and importance of events are not measured by the absolute magnitudes of the events but by the more specific relationships they bear to our appreciation of them. Satisfaction with wages, hours, working conditions within the middle ranges, to paraphrase the limitations set to Weber's law, are more dependent on what the other fellow gets, how long he works, and where he works than upon any direct understanding of the actual differences in amount of or method of payment.

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Let me recall at this point some further data on the learning curve. We have not drawn the complete curve until we know the relation between speed of reaction and the limits of the machine, if it be a machine operation. If the machine can be operated more rapidly than the most rapid human reaction necessary to tend it, we can then find the human limits of speed and skill. Under other conditions, we cannot. Turning to the human side of the equation, Fernald's endurance or will test illustrates vividly the possible congeries of factors operating. The test is simple; to stand on one's toes until it is impossible to stand in that manner any longer. Though not a natural position, there seems to be no short physiological limit beyond which one cannot go. The subjects when they quit usually said, "Oh, I just quit," or "I decided I had stood long enough," or merely, "What's the use?"

Here is where a rough generalization of Weber's law recurs to us. The decreasing value of the stimulus due to adaptation, habituation, fatigue, or change of interest reaches a point where the ratio between stimulus and mental process no longer gives the just noticeable difference necessary for a rising or even level learning curve. The introduction of other stimuli, incentives if you will, or decreasing effect of these may again raise this ratio to its standard fraction.

Note that I am not advocating continuous work at the peak. Stephen Leacock tells of the calculation whereby the addition of two, four, etc., ounces of food would cause a hen finally to lay 20 eggs per week. His partner, enthusiastic over the possibilities, suggested they start at once feeding the hen 16 ounces per day. He adds: "I had to remind her laughingly that at 8 ounces a day the fellow would probably be working up to capacity, and carrying what we call in business his peak load. The essential factor in business is to load up to the peak and stay there."

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[11] Pyle, W. H., "The Psychology of Learning," Warwick and York, 1921, page 32.

[12] Gantt, H. L., "Work, Wages, and Profits." The Engineering Magazine Co., 1919, page 186.

The theoretical learning curve must be built with those persons and those incentives which operate continuously at their highest efficiency. At the opposite extreme is that learning curve which is made up from an average of observed practices influenced in usual but analyzable ways. Between these somewhere lies the standard practice curve. The average and standard curves are variables which are conditioned by various factors present in differing degrees in a given plant or department.

It is an experimental problem. The laboratory has furnished us a mass of data but little of it has been made available to the shop and office. We cannot even reach standards of capacity for a position, for cost of training, for cost of turnover, for methods of training, and for efficiency of supervision without a deeper insight into the meaning of the learning curve than we at present are using.

Let us look briefly at experimental possibilities in the question of turnover. I have elsewhere described what seem to be basic requirements for the analysis of turnover. To summarize these briefly, I believe we need to know much more concerning the psychological nature of jobs that people enter and much more regarding human qualities really essential to the successful doing of each task. To further this information, we need, in the second place, more thoroughgoing research resulting in description and definition of human traits. Our educational program and employment program as well have based action upon ideals and concrete demands more than upon the requirements of the individuals taught or hired. The employment department of business and industry has sought primarily to fill the particular job now vacant, rather than to find the individual, who, though able to fill the job, has in him potentialities for greater future service with the company. In the third place, both the educational program and the employment program forget that the nature of an individual is continually changing, that the person taught or hired may soon be quite different in purposes and objectives. These three things constitute in my opinion a projected program of research which will give sound principles for the employment office.

My purpose is to set out a few somewhat sketchy observations made in plants and offices with reference to a type of research necessary in business and industry in order to organize material important for developing an employment and promotion procedure. I shall not discuss here the technical methods by which such results have been obtained. In some cases, the procedure is still that of ordinary observation; in others, we have applied all of the scientific technique at our command. In examining the nature of turnover as pointed out by various writers and as determined by your own investigations, there seem to be at least four important elements causing the shifting of individuals from one occupation to another, from one plant to another, and even from one community to another. These are (1) adolescent restlessness, (2) differences in individual capacity, (3) social status, and (4) individual interests. By these I do not mean to imply that the ordinary terminology used in turnover, such as resignations, discharges, layoffs, etc., are not valuable terms worthy of careful definition. I believe, however, that their importance rests on further analysis which can best be described in terms similar to those I use.

1. It is a matter of common observation that the greatest turnover occurs during the period just after leaving school. The Scott Company has presented figures confirming this. Kitson, in a recent article, has summarized these figures and additional ones obtained by himself. The work of employment bureaus reaffirms the point, though mainly as a result of observation and with few supporting statistics. Careful statistical observations in a company which takes on three to five hundred young men, and almost as many women, at the age of sixteen, bears out the same conclusions. The turnover of individuals from sixteen to twenty years of age is about 400 per cent. The turnover among individuals above that age drops to 40 per cent and below. This company provides afternoon and night school work equivalent to that of the ordinary high school. The class work is closely related to the work in the plant and every effort is made to relate the two. Our investigations of turnover in offices present similar data. Seventy-five per cent of the men and women have been with the companies investigated less than five years. This fact in itself might simply mean that the age factor was the essential feature. But a follow-up among those who are older indicates that relatively few, some 15 per cent of these, will be found in the office three and four years later. Continuity of service is not present.

Are we confronted with a fact? Is it necessary for us to recognize this as something which cannot be changed and inheres in the nature of human beings? We might consider it as one measure of the success of vocational guidance and employment methods if the length of service of persons on their first job can be increased. However, until we know more about the relation these first jobs bear to the job representing the longest service for any individual, we shall not be sure that our success in increasing length of service on the first job is a really desirable success. I believe this points very clearly to the need for detailed and systematically compiled work histories of many individuals.

Dr. Bills[13] has called to my attention observations of interest here. She suggests that ambition with or without ability may explain differences at this age. Also that other positions are easier to get and these younger men and women are burdened with less responsibility. She suggests further that of every fifty older persons, at least forty would change their occupation if the opportunity offered itself. If comments of this type can be established we have explanation for changes in rates of turnover with age, though no solution. If any one of these observations becomes established generally we are at once confronted by the knowledge that we have not been collecting the right sort of data and that much of our painstaking mathematics of wage payments is wasted effort.

2. Relating human capacities or specific ones to the multitudinous tasks of modern industrial organization is an enormous problem. Some beginning has been made in the investigation of the relation between mental alertness tests and turnover. It has been shown that on certain jobs high mental alertness scores and low ones represent two points where high turnover occurs. In other departments of the same plant, precisely the reverse phenomenon may occur. In office work where promotional facilities are good, more of the brighter individuals will be found with relatively long service records. In offices where so favorable a situation does not exist, only the duller individuals show relatively longer service. In special departments in the office, the situation in the plant described above can be duplicated. Jobs that require little learning capacity and are largely routine in nature interest the person of average intelligence and keep him occupied. Those of higher intelligence become dissatisfied and soon quit. The restless individual who is inclined to rove or inclined to tasks that require some physical exertion will, regardless of intelligence, be dissatisfied in the office. Of 46 per cent of office workers in a company, who had been with the company more than five years, 50 per cent, or just half of them, were carrying on remunerative outside work regularly. Several others had remunerative work outside of the office which they engaged in sporadically. These tasks range from raising gold fish and chickens to auto mechanics and various sorts of outside selling.

It is not to the point here to attempt any classifications of the qualities and capacities of individuals which lead them to become dissatisfied or to be seeking continually tasks more appropriate to their abilities. I wish to emphasize rather the necessity for making such a classification and the importance it will have in determining the nature of employment and maintenance problems. We are all aware that there is much to be done in business and industry before the potentialities of individuals are really utilized there. Nevertheless, an increase of our knowledge concerning human capacity will demonstrate more than argument can the importance of allowing employees to know the lines of promotion available and the character of the jobs which are open to each individual worker.

3. A third important factor in turnover is described by the relatively vague term "social status." The contrast between the "atmosphere" of two department stores presents an immediate classification of persons who have opportunity to go into the one or into the other. We find at all levels in our study of turnover individuals leaving one job for a better one which does not always mean increase in pay. It quite frequently means a change in social status. The general desire of both parents and children to improve the social status has led to certain movements which presumably increase the number of applicants for white collar jobs and decrease those willing to go into the trades or similar tasks of assumed lower status. It has been found very difficult to hold college men in many forms of selling. Increased effort on the part of sales managers to obtain college men as salesmen has not yet produced a stable group of college men in sales. A general psychological and sociological investigation of the reasons for any particular task obtaining a definite social status is imperative.

4. Intertwined with both the capacities of individuals and their social status and the implied social status of different jobs is the problem of interests. We have been able to demonstrate that young men in

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[13] Marion A. Bills, formerly Associate Director, Bureau of Personnel Research, now Consultant in Office Organization and Management, Hartford, Conn.

college who have selected engineering and plant management for study differ materially in their interests from those who have selected sales as a future occupation. Within the college group of engineers, it has been demonstrated that there are many who are more closely related to salesmen in their interests than they are to practicing engineers. Though we assume the engineering profession can assimilate all persons graduated as engineers, it has, nevertheless, been shown by statistical studies made at the larger engineering colleges that from sixty to sixty-five per cent of the graduates are to be found in occupations other than engineering five years after graduation.

We are all familiar with the isolated cases, which in the aggregate are numerous, of boys and girls fighting for an opportunity to follow a particular interest. With these things in mind, I believe that it is important for turnover analyses that we know more accurately the opportunities associated with special interests and more thoroughly the nature of interests themselves. It is important to be able to determine the permanent interest and to separate from it those which are more or less adventitious and dependent upon temporary circumstances.

It is necessary to establish more thoroughly and more generally the truth of the causes for turnover I have suggested. The specific program I would recommend breaks up into four lines of statistical inquiry. To test the meaning of adolescent restlessness there is need for detailed and systematically compiled work histories of many individuals. Further research and the presentation of data in usable form on the qualities and aptitudes of human individuals is needed by the employment office. A psychological and sociological investigation of the reasons why any particular task obtains a definite social status is desirable. The fourth line of attack will attempt to distinguish between permanent interests and those dependent upon temporary circumstance.

IV

The limits of time do not permit us to pursue the topic further. Experimental psychology as a branch of psychological inquiry differs only in its efforts to quantify and to hold constant, or to vary, the factors in any given situation. When it finds a factor, its scientific caution prevents a precipitate artistic or mathematical application to the complex situation. Training in statistical procedure is one factor in helping us to maintain this balance. I have endeavored to show by analysis rather than criticism that much of the effort we have expended in wage payment plans is of no avail because of the non-observance of a scientific caution. The analysis presented in connection with the question of turnover leads us to a similar conclusion. Except that here we have not progressed so far along the least fruitful path. Attempts to solve the questions by cost accounting methods without the collection of all pertinent statistics are, however, direct wastes that go into overhead. Detailed statistics with complete descriptions of the conditions out of which the data arose would be of immensely greater value for solution of proper incentives, than the generalized ratios with which we now attempt to work. I respect mass data when treated with the proper statistical tools. I do not believe that year to year comparisons are adequate mass data. The familiar statement that this or that phenomenon is an improvement over last month or last year carries little conviction. Quantification that goes no further into the variables whose change in weight have produced the changed ratios gives no basis for stabilization of an improvement.

The continuous struggle with spoiled work, absenteeism, turnover, unemployment, wages, etc., is in the forefront of things we seem always to have with us. My contention is that with a better appreciation of the human factor, these, together with accidents, selection, promotion, and the understanding of each other, are open to solution. This better appreciation necessarily results in the recording of an entirely different series of data than is now customary. It also involves an agreed-upon willingness to experiment. Step by step it is being proved that every worker who understands an experiment finally enters into it with zest.

Discussion

Adelbert Ford.[14] When Professor Yoakum emphasized the fact that the solution of labor problems must come from a nice balance of artistry and scientific precision he stated a principle which offers a solution to the general problem of correlating the best there is in the scholastic world with the best there is in the world of practical living. Certainly our employment "expert" must be a man capable of the finest conceptions of human living, and yet the mere enthusiasm over ideals, if unchecked by careful quantitative measurements, can lead to the grossest illusions and the most painful forms of injustice. And certainly it seems that a bare statistics of muscular efficiency can lead to such an automatization of labor that a worker may leave an objectively productive career mentally mutilated.

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[14] Instructor in Psychology, University of Michigan.

We cannot blame either method of approach as being totally false, however. It is as Professor Yoakum has indicated—there is a need for a combination: the keen insight into the values of human life, coupled with such a scientific method as will insure that we are not embracing fallacies under the guise of great ideals. It seems to me, therefore, that the greatest problem confronting employment management is the employment of a good employment manager. Dealing with the most complex science yet developed—human behavior—requires a man of unusual calibre. Because he is an integral part of an industrial organization, he must be able to see, in a practical way, his function in the work as a whole; and because the rules for labor management are as yet either unformulated or insecure he must also be trained into that mental attitude of method and precision characteristic of the research student. It is only too true that such a combination of traits is seldom found; he can possess one or the other but rarely both.

Therefore, what kind of training? Psychological? Yes, but not the kind of knowledge which consists in mere abstractions from experiments on nonsense syllables, or the technique of an Army Alpha test, unless the experimenter knows that such information is an adequate measure of real life. But let it not be assumed that the laboratory psychologist is necessarily divorced from real life. These same experiments in the hands of a man who has really mixed with human beings take on relations of the greatest significance. After all, the research worker in the field of labor conditions who is untrained in the field of pure psychology and the work of abstract science is generally short of an accurate view-point; his aim is lacking. He may be shooting at his problems with a shotgun load of statistical formulae, and a stray correlation may hit something, but unless he has the imagination to see what he is aiming at, the success of his work is a matter of chance. And that imagination, according to recognized laws of psychology, necessitates an adequate experience. In this case we mean experience with the conditions of human living. Such an experience is not satisfied by a little dabbling in the field of social service; slumming is not a substitute for experience with human nature.

The old type of employment manager, with his unstandardized procedure, his superstitions, his biases, his grudges, and his awful ignorance of the laws of exact measurement, is passing. The chasm between the man of pure science and the man of business is getting narrower. Occasionally the world of industry reaches into the world of scholars and picks a helper. It is a compliment to us that we are given this great opportunity. But the newcomer, I fear, has frequently proved a disappointment. Not every young girl, fresh with her Ph.D., is a qualified labor expert, though she may know ever so much about the technique of mental testing. Of course, she sometimes shows the world she knows what she is doing. I know at least of one such case—I believe the one cited by Professor Yoakum—but she is the exception, not the rule. Generally the green graduate lacks something of the mature scientific viewpoint, or the fundamental experience with human nature—the kind of rough, primal human nature, with its mental unbalance, its uncontrolled emotional expression, its warped reason, its sympathy, its pride, its sensitiveness, and its social power. We need the employment expert who knows pure science, who can handle mathematical measurements as a familiar tool, who has high ideals for human nature, who knows that human nature from actual experience, and who knows how to be precise in his measurements without being petty.

Such people are rare, but we do have a few, both men and women—so few that we shall probably have to share their contributions for the benefit of all. Of course we can hire the young graduate for a nominal sum. A Chicago taxi-cab company decided, instead, to hire her professor, and he proceeded to give results so rapidly, with such certainty, that he proved beyond all doubt that he knew what he was aiming at. In the face of the saving in property, the saving in human lives, to say nothing of the purely selfish advertising value of the experiment, the salary of a well-trained man proved an investment. Of course, the requirements of modern research sometimes prove too expensive for one industrial institution to support. The attitude of sharing good methods has already been mentioned this morning as one of the most beneficial advances in progressive modern industry.

We have a new thing—a precise science of labor management. Let's get together and help it to grow to a more sturdy and mature condition.

Lillian M. Gilbreth.[15] Dr. Yoakum's discussion is a plea for research, the more powerful because it is stated in positive terms. It gives us the needs in industry in terms of our own problems and largely in our own vocabulary.

It reviews our progress, or perhaps we had better say history, constructively, in that it points out not only what we have done that is of value but which parts of our activity have been useless or have been over-emphasized.

It points out as well errors in psychological investigations or conclusions, as for example where the accepted theory of learning curves is criticized.

It stresses most emphatically the need for accurate measurement and the importance, in every field, of adequate criteria.

It suggests to the reader, as an associated cause for delay in solving personnel problems, the long space of time that is allowed to elapse between the recognition of a subject as worthy of investigation and the actual general participation in such an investigation.

For example, it is now more than ten years since the relation of psychology to management was brought to the attention of the Taylor Society,[16] yet only within the last year has the subject received much attention. It will soon be ten years since the importance of psychiatry and mental hygiene as factors in better industrial relations was first demonstrated,[17] yet it is a matter of months since this subject was first discussed at a meeting of this group.[18]

The importance of correlating with findings of investigators in the human sciences outside this country is not as yet appreciated even by investigators in the specific fields.

Nor are investigators in the engineering field more open-minded and progressive. In spite of the fact that industrial engineers have been in production work going on twenty years and are entering the fields of office management, sales management, and, most recently, finance, records are so poor and so seldom contain details as to *causes* that they furnish most unsatisfactory criteria.

Dr. Yoakum's paper should, then, serve not only as a stimulus to investigation but also as a guide to that exactness of method which alone can make investigations truly profitable and to that correlation which alone can prevent duplication and serve as a guide to future development.

Z. C. Dickinson.[19] I believe we should give more attention to promoting cooperation between business houses and scientific institutions, in order to advance both pure and applied psychology more rapidly. The work of pioneers in industrial psychology, like Muensterberg, shows abundantly that the cloistered and apparently useless science of experimental psychology can be turned to practical account by shrewd scholars, when they gain access to practical facilities. The contributions of managers like Taylor, on the other hand, have been of great value to pure psychology. But the academic laboratory suffers from lack of human material who may be observed under normal industrial conditions, while the researcher employed by a single business, like the manager himself, is under such pressure for quick practical results that his investigations are likely to lack scientific rigor. Therefore, arrangements like the Carnegie Institute's bureau, with which Professor Yoakum was connected, whereby the financial burden of fundamental research, as well as the bother of subjecting employees to experiments, may be shared among the various parties who will ultimately benefit by the research, should be multiplied.

Harry A. Wembridge.[20] We have just listened to a splendid appeal for research in personnel administration. But Dr. Yoakum has gone further. He has selected for us certain important personnel problems and suggested a method for solving them.

That there is a great need of personnel research is not universally accepted, but most thoughtful students of the problem agree that only through the method of scientific measurement can any real progress be made. The handling of people is considered by many business men and personnel directors to be more of an art than a science, and perhaps because of this there has been considerable reaction in recent years against personnel activities, which were admittedly not based upon measured results but upon emotional and fanciful judgments.

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[15] President and Treasurer, Frank B. Gilbreth, Inc., Montclair, N. J.

[16] Tuck School Conference on Scientific Management, Dartmouth College, October 12-14, 1911.

[17] E. E. Southard, "The Mental Hygiene of Industry," *Industrial Management,* Vol. 59, No. 2, February, 1920, pages 100-106; "The Modern Specialist in Unrest—The Place of the Psychiatrist in Industry," *Industrial Management,* Vol. 59, No. 6, June, 1920, pages 462-466.

[18] Elton Mayo, "The Basis of Industrial Psychology," *Bulletin of the Taylor Society,* Vol. IX, No. 6, December, 1924.

[19] Associate Professor of Economics, University of Michigan.

[20] Cleveland, Ohio.

This disillusionment has been conspicuously true with reference to mental testing. Intelligence and allied tests were introduced into many industries on the wave of popular interest in such matters which followed the war. By this time their popularity has greatly diminished. The reason for the supposed failure of these tests to do what had been expected of them was the incorrect assumption that there must necessarily be an absolute correlation between success at any work and mental ability or alertness. The tests failed only in that they could not do what no one had a right to expect they should do. They undoubtedly isolated in a quick and satisfactory manner those whose intelligence was so deficient that they could not be depended upon to do any satisfactory work. But in a study, using several kinds of tests and correlating the results with actual performance on standardized operations, I found that there remained approximately 90 per cent whose success in the test was not correlated with their measured performance. That the tests were of economic value in eliminating those who had no chance of success at their work was apparent from the correlation table and from the actual experience that followed. But with the main body of workers success depended not merely upon their mental alertness but also upon some more intangible factor, that is, the incentive which would make them want to work. Most workers, like most of us, apparently had more brains than they used. But a deeper analysis showed that what is a constant and imperative demand is the incentive to make us use even that necessary minimum of thought and energy which we all possess. Therefore, the personnel problem shifts from merely one of intelligence to an analysis and organization of motives.

Business is based upon the assumption that money is the main, if not only, incentive. That it is the most powerful one there can be no question, but we have in the past failed to tie up the actual payment with the emotional factors connected with incentives. Moreover, there are other incentives which operate in special cases even more powerfully than money. To illustrate my meaning I will instance only two or three examples of the innumerable number that could be chosen. There is the incentive of getting home early or of changing one's social position by working in the office rather than in the factory. Again, the young factory workers whose wages go automatically to their parents have very little interest in a money increase which they cannot spend. For these the financial incentive works only when it involves overtime wages which they can, without detection, appropriate for themselves.

Many instances could be cited where money unattached to other motive forces has failed to inspire the worker to do his best. In fact a complete study of adequate motives would be a study of all life—a field which I hardly planned to cover. Moreover, I disclaim any pretense to originality in emphasizing the importance of motives.

The employer would be following the lead of modern psychology in leaving for the time the intensive study of thought processes to investigate the more important forces of emotion which make up the background of thought. In fact, William James, the greatest of American psychologists, made the statement some twenty years ago in his famous address, "The Energies of Man," that most people realize their capacities only when some exceptional situation has forced upon them an emotional stress involving a motive sufficient to make them use the talents which have hitherto remained latent. The employer and personnel manager of the future must, therefore, not only be versed in the routine matters of personnel, but he must be able to organize and develop incentives so as to call forth from his workers their best efforts.

Next Meeting of the Taylor Society

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An attractive program is being planned. Make your plans to attend.

658.(06)

The Work and Aims of the Taylor Society[1]

An Open Forum for Open Minds Seeking by Methods of Science the Solution of Industrial Problems

By **PERCY S. BROWN**

President, Taylor Society; Works Manager, Corona Typewriter Company, Inc., Groton, N. Y.

IT was among engineer-trained executives that consciousness of the management problem first began to find expression in what has come to be known as "the management movement." During the '80s the development of big-scale industry was under way and brought with it problems centering about the supervision and control of operations. The analytic engineer-mind first perceived and attacked the problem. In 1886 Henry R. Towne clearly set forth its nature in the famous paper before the American Society of Mechanical Engineers, *The Engineer as Economist,* and for nearly a decade thereafter meetings of the American Society of Mechanical Engineers and technical engineering journals offered the only forum for study and discussion of the management problem, in which there was a growing interest. This was a natural center for the beginning of interest in management. The problem had been created by big-scale enterprises utilizing labor-saving machinery under division of labor, and it was one of learning how to manage the use of machines—of production. It was not then a problem of selling, for America was uncovering abundant new resources, population was increasing rapidly, purchasing power was increasing more rapidly, and there was a continuing sellers' market. The management problem first took the form of complications in the utilization of machinery, and it was inevitable that the first group to be challenged by it should consist of the very men who were inventing and installing equipment, and endeavoring to teach industry how to manage it.

Origin and Lineage of Taylor Society

But all engineering sciences were growing rapidly during this period, and by 1910 the American Society of Mechanical Engineers was confronted by the problem of settling the scope which its resources and facilities would permit its work to take. It was decided that the greater service would be rendered by emphasizing pure engineering, and consequently study and discussion of management found its opportunity restricted.

There being no other forum, a small group of about a dozen members of the A. S. M. E., led by such men as James M. Dodge, Frank B. Gilbreth, Robert T. Kent, Conrad Lauer, Carl G. Barth, Morris L. Cooke and H. K. Hathaway, began to meet regularly for continued, more intensive, discussion of management. There was at the beginning no formal organization of a "society," but in the winter of 1910-11 the organization was made formal and the Society to Promote the Science of Management came into being. This formal organization was stimulated by the marked general increase of interest in management caused by testimony concerning the achievements of scientific management at the Eastern Rate Case Hearings, and more particularly by the fear that, because of the sensational nature of the testimony concerning results, there would be a grand rush by industry to "get efficient quickly," and the very engineering technique which had brought the results would be neglected and eventually lost. The group decided that it was a service obligation for them to strengthen their position as defenders of the engineering point of view.

The Society to Promote the Science of Management continued to hold meetings of a more formal nature, and in December, 1914, began the publication of a periodical bulletin. The quality of its discussions and published articles attracted some attention and caused a gradual and unsensational increase in membership, so that by the outbreak of the war, in 1917, the membership was something over 100. No campaign for membership increase was undertaken, the policy being to preserve the homogeneity of point of view and technical approach towards management problems, and to let membership increase be the result of natural attraction of like-minded executives and engineers.

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[1] Reprinted, by permission, from "Science in Modern Industry," Vol. CXIX of *The Annals of the American Academy of Political and Social Science,* May, 1925.

During the war nearly all the members became absorbed in one way or another into the war machine, and the society became quiescent. But immediately after the Armistice activity was resumed and on a larger scale. Perceiving the magnitude of the industrial problems which would inevitably result from maladjustments left by the war, and believing it had something to contribute to the solution of those problems by emphasis of the engineering approach, whatever the area of the field of management in which the problems might arise, the society organized deliberately for larger service, established a New York office with a full-time executive, and, in honor of the pioneer of engineer-executives who had died in 1915, changed its name to the Taylor Society. Since that time its membership has gradually increased to some 800.

Purpose and Range of Interest

The above account of the origin and lineage of the Taylor Society is important, as it makes more understandable the purpose and methods of the society. In the first place, it is the descendant in direct line of that group of engineer-executives—such as Henry R. Towne, Oberlin Smith, James M. Dodge and Frederick W. Taylor—who first perceived the emergence of a management problem in American industry. In the second place, it inherited from that group and cherishes the engineering point of view and method of attack on management and other social problems. In the third place, descended from men who had been trained as scientists and who valued the search for truth for its own sake, it is without ulterior motive or special interest, and is not afraid to consider any problem within the scope of its general interest, and particularly to consider all facts, whatever their source, bearing upon any problem which falls within its field. These three things, I believe, together with certain features of organization and methods of work resulting from them, are the outstanding characteristics of the Taylor Society.

Faithful to these traditions, it has fearlessly searched for, appraised, and put on record the most progressive and noteworthy thought and practice with respect to every phase of management which has assumed importance as changing industrial conditions have defined importance. Its first inquiries were concerned with production, for on a sellers' market that was then the important problem of management, and the Taylor Society believes that fundamentally and in the long run production will always be the most critical management problem. But when complications of big-scale industry caused industrial relations to become a problem of outstanding importance, the society considered it in a characteristic manner. It was the Taylor Society which promptly gave such progressive thinkers as Robert Valentine and Robert Wolf a forum, and which more recently established real contact between psychologists and industry. And when the buyers' market generated by the war came upon American industry, the Taylor Society promptly made inquiry into two phases of management which emerged as of major importance—general control and selling. Nowhere are there to be found records of more searching inquiry and more fruitful suggestions concerning the function and technique of coordination and the function and technique of selling than in the published bulletins of the Society.

What may result from the engineering method of approach to such a problem as that of industrial relations? That method, distinguished by insistence upon ascertainment and measurement of all the facts pertinent to any problem, as applied to the problem of industrial relations has unmistakably established two conclusions: that the human element is as real a factor in management as is the mechanical and cannot be disregarded in any adequate system of management; and that the regard for the human element in any system of management must itself be upon a factual and not an emotional basis. Too many of the studies of industrial relations during the past ten years have been dominated by emotionalism and have resulted in ill-considered methods of personnel management. In too many instances personnel management has been assumed to be something separate from operating management, and personnel departments have been plastered onto instead of incorporated into operating organizations. Fortunately most of these mushroom-growth personnel departments were eliminated by the depression following the war, and industry is now able to approach its problem of industrial relations anew along those sounder lines which make good or bad industrial relations a function of good or bad policies and methods of operating management. It is in the process of engineering its policies and methods of operating that an enterprise is engineering its conditions of human relations. This was noted recently by Miss Mary Van Kleeck, of the Russell Sage Foundation, in the following words:

> My experience began with what is called the human element in industry, and I saw it first outside the shop in the community. In the lives of wage-earners, particularly women in industry, I saw the effects of long hours of work, unemployment and low wages. In the search for remedies I was led back into the causes of these conditions in the shop itself, and nowhere did I find so many questions in process of being answered as in the Taylor Society. Not the final answer but the process of discovering the answers was for me the big contribution of this group . . . My interest in the Taylor Society is not directed toward challenging the technical engineer to give attention to problems of human relations. I am not worried about that, because if he is a good engineer he cannot fail to contribute to human relations. I am concerned rather with the other end of the story. I am eager to have those people who see in the community the present disastrous results of industrial organization realize how the art of management in the shop can fundamentally change those social conditions in the community. The Taylor Society can thus interpret management to the group who are seeking to construct a better community.

Engineering Point of View

This faithfulness to ancestry has imposed upon the Taylor Society certain restrictions which it has recognized and accepted. In the first place, insistence upon the engineering point of view and method of attack upon problems has permitted only modest growth in membership, for executives whose background is that of frontier conditions—American industry is just emerging from frontier conditions—come slowly to appreciate the engineering point of view and methods. Yet it is interesting that the membership of the Society is today made up chiefly of executives who have not had engineering training and have not been concerned with what are generally regarded as engineering responsibilities. That means, of course, that the mental attitude identified by the term engineering is independent of particular training, and it means also that an increasing number of American executives are developing the habit of approaching their problems in an engineering fashion.

That the engineering point of view and technique should gradually appeal to an increasing number of manufacturing executives was to be expected. But it is somewhat surprising to find that its march has been so rapid as to excite the interest even of executives of merchandising enterprises. The organization under the inspired leadership of A. L. Filene, the Boston merchant, of such an enterprise as the Retail Research Association a dozen years ago was a venture in organizing for an engineering attack on problems of retail management. And recently E. A. Filene, the other of the two sons of Wm. Filene's Sons Company, has in his book, *The Way Out*, specifically declared the necessity of the engineering method in solving our industrial problems. I cannot refrain from quoting the following:

> American business has reached its last frontier . . . . As society develops the pioneer must be succeeded by the engineer. . . . The business men of tomorrow must have the engineer-mind. We would better turn our energies to the urgent job of substituting the engineer-mind for the pioneer-mind in the American business of the future.

That is exactly what the forebears of the Taylor Society saw, and what the Taylor Society has made it a mission to persuade American industry to see.

Definite Philosophy

Again this faithfulness to ancestry has imposed limitations in growth for the reason that the engineering point of view demands the acceptance of a definite philosophy and technique of management. One cannot have the engineering mind and fail to systematize his thought and methods. Therefore the Taylor Society has accepted, in a liberal way, the only philosophy of management which research has yet enabled industry to formulate—the Taylor philosophy. It is either that or no unifying system of thought—no one has formulated an alternative. Therefore, although subscription to the Taylor philosophy is not a condition of membership, the very fact of the Society's acceptance of a governing system of thought in its investigations of management problems, and in its appraisal of management experiments, is a deterrent to rapid and spectacular increase of membership. Some executives do not desire to accept consciously, however tentatively, any system of thinking; and particularly some do not desire to be identified with the Taylor philosophy because of failure to perceive its essential nature and separate that from incidents of controversy during the early days of its formulation. The Taylor Society recognizes all of this, accepts the consequences of temporary restrictions, and goes seriously on its way, for it is "bullish" on the value of the engineering point of view and its ultimate acceptance by American industry, and on the spiritual and intellectual strength which comes from guidance by a definite system of thinking which contains within itself the principles of adaptability to changing conditions and the requirements of new information.

Methods—Possible

The characteristics of the Taylor Society which have been described naturally influence its organization and methods of work, and cause them to be different from the organization and methods of other societies having a similar and equally worthy purpose. The operations of a management society may be distinguished in the large by the manner in which it combines and emphasizes certain possible elemental operations. The most important of these elemental operations are as follows:

A. Investigation

1. Genuinely scientific research through a staff of paid experts.

2. Group organizations of the membership for comparison of experiences.

3. Discovery, discussion and appraisal of the results of significant research and experiments by specialized research organizations and progressive industrial enterprises.

B. Service to Members

1. Meetings

a. Carefully organized programs featuring selected advanced ideas and practices.

b. Carefully organized programs featuring general participation of members and comparison of their experiences.

2. Publications

a. Containing selected and edited material derived from meetings of the type B1a and similar material from other sources.

b. Containing articles reflecting records of general membership experience derived from meetings of the type B1b.

3. Advisory and Information Service

a. Information related to particular problems rendered to members in response to inquiries by correspondence and personal interview.

4. Miscellaneous Service

Such as assistance in securing particular types of personnel for member's organizations, introductions for those on tours of inspection, etc.

C. Public Service

1. Promotion of and participation in programs of a public nature, involving management problems, undertaken for the public welfare.

It is obvious that to perform all these operations adequately would require large resources and a considerable executive staff, and no management society finds itself in that happy position. So the problem of organization and methods consists of choosing and emphasizing elemental operations such as those enumerated above.

Methods—Adopted

Because of its moderate size and limited resources the Taylor Society has had to choose carefully. The choosing has been influenced also, obviously, by the society's origin, antecedents and point of view.

In general it has chosen to apply its limited resources to the fields of investigation and service to members rather than to the commercial phase of increase of membership with corresponding neglect of the investigation and service activities.

With respect to investigation it has recognized the impossibility of expensive genuine research through a staff of its own. It has emphasized, in the work of the *national* society, the discovery, discussion and appraisal of the researches of specialized research organizations and the experiments of progressive enterprises. On the other hand the investigation involved in comparison of experiences of members is emphasized in the work of constituent *regional sections.*

This is reflected in the programs of meetings and in the BULLETIN OF THE TAYLOR SOCIETY. The meetings of the national society feature the presentation and discussion of new and progressive ideas and practices, whether by members or non-members, and the *Bulletin* features articles of a similar nature. The more frequent meetings of a regional section, on the other hand, emphasize the consideration of problems, practices and experiences common to the membership of the particular section.

The advisory and information service is an experiment and time will be required for members to learn to use it and for the society to learn how to render the service. But it is growing slowly; members of all classes—old and young, engineers and executives—are utilizing the executive staff of the society as a center of information bearing on their problems. As the fund of information which members may tap increases in quality and quantity—and the very nature of the operations of the central office of the society causes it to increase—members will more and more utilize such facilities of the society.

The society has not hesitated to cooperate with others in programs motivated by the desire for improvement of social conditions where such improvement has involved problems of management. A noteworthy instance was the publication of Horace B. Drury's study of the three-shift system in the steel industry, a study the influence of which, combined with the influence of other similar studies, brought about a significant change in management methods in the steel industry. Another instance of international public service was the acceptance by the Taylor Society of detail labors involved in the organization of the effective contribution of the Committee on American Participation to the Prague International Management Congress in 1924.

The Taylor Society is interested in advancing sound thinking concerning the management problem throughout its entire range, in promoting understanding of established principles and discovery of new principles, and in assisting its membership to the command of an engineering technique of investigation and a flexible technique of management derived by that method of investigation. It welcomes to membership all who have become convinced that "the business men of tomorrow must have the engineer-mind."

Production Control Reports[1]

The First Step in Increasing the Efficiency of Office Departments

By Frank L. Rowland[2] 651.

Manager Personnel and Planning, The Lincoln National Life Insurance Company, Fort Wayne, Indiana.

IN COMPARING the progress made to date in the development of office organization and management, with that attained in the field of factory activities, it is necessary to recognize some of the fundamental differences which exist in the two departments of management. During the past few years I have entertained the thought that we who are primarily interested in the development of the science of office management have been too ambitious in our desire to apply the later-day tools of scientific management which are the resultant of a process of evolution through which office activities have yet to go. In other words, there has been an attempt in many instances to transplant the present-day procedure found in factory management to a field which is anything but ripe for the process.

In a factory organization the factors of material and machinery have a much greater significance than in the office where clerical activities predominate. In the latter type of organization the mental factor is, by far, the most important—machinery and material being of secondary consideration. In a factory organization the machine generally sets the pace—or, at least, is in a position to do so—while in the office the individual in the main controls this factor. In view of the fact that clerical activities are of a mental—or at least of a mental mechanical nature, greater concern must be given to the numerous psychological factors involved in the management.

Theoretically, at least, office operations are susceptible to the same type of scientific analysis as is applied to factory work. Any office job, regardless of its complexity, may be split up into its component parts and a standard production time set for each operation. To apply these advanced practices in a practical manner to all operations of an office is, however, quite a different problem and presents difficulties which, to the average office manager, seem insurmountable. It has been my observation that more has been written and said concerning the application of scientific production control schemes to office work than is to be found in actual practice. What successful work has been done along these lines lies primarily in the field where mechanical or semi-mechanical operations predominate, and where office machinery is used extensively. This applies to such clerical operations as filing, typing, mechanical billing, etc. When the average office manager gets beyond this limited field, he is very likely to become lost in the maze of variables that spring up at every turn, and to find that the cost of keeping the records necessary for his production control exceed any possible value which may come out of the scheme.

A part of my business career since being graduated from this institution twelve years ago has been spent in factory organization work. The last few years have been devoted to an intensive study in the field of office organization and management. I can frankly say from my own experience that the latter field presents by far the greater difficulties in attempting to introduce the principles of scientific management.

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[1] Presented as a discussion of a paper by W. H. Leffingwell on "The Present State of the Art of Office Management" (*Bulletin of the Taylor Society*, Vol. X, No. 2, April, 1925), at a meeting of the Taylor Society at the University of Michigan, Ann Arbor, May 15, 1925.

[2] Past President, National Association of Office Managers; Secretary, Life Office Management Association.

We have heard during recent years, in discussions concerning factory management, of the strategic position held by the foreman; a great deal of time and attention has been paid to the selecting and training of this important individual. It has been realized—and rightfully so—that the foreman holds a "key" position in the organization, and that he must be thoroughly imbued with the ideals and policies of the management in order that any plan of operation may be successfully transmitted to the men over whom he presides.

I have been impressed with the relative lack of attention which has been given to this same situation in the development of the science of office management. Few institutions have any very definite plan of selecting and training office supervisors and department heads. This is even true in institutions which have devoted considerable time and attention to the subject of controlling the production of individual workers. The importance of stimulating the department head to view his responsibility from the angle of obtaining the maximum production at minimum cost (with due allowance for quality) cannot be overemphasized in any scheme of scientific office management. Few offices have adequate records which permit the compiling of this information, without which the management is in no position adequately to appraise the work of a department head in administering his particular responsibilities.

We of the office will readily concede, I believe, that viewed from the standard which scientific operation and organization has attained in the factory, the office has made relatively little progress. Recognizing this condition, it is, in my opinion, highly inadvisable to attempt to apply the later-day developments in the field of scientific management to the office. For this reason my field of endeavor recently has been along the lines of stimulating the interest and activity of the department head in the ways of scientific office operations. The plan which I have used successfully during the past two years could not be termed highly scientific; however, it is highly effective and builds a foundation for more intensive scientific development.

Briefly, the plan I refer to comprehends the providing of information, available to the management and department heads, which will clearly set forth the controllable cost of operating each department, together with an equitable index of production resulting from the given cost. Behind this plan is an attempt to educate our department heads to the point where they will recognize that their value to the organization, to a large extent, is based upon maintaining an equitable ratio between output and cost of output in the group which they supervise.

The first step in the procedure is to establish a classification of office operating accounts which will readily permit the grouping of all controllable costs departmentally. The largest item of controllable cost in office work is, of course, salaries; other items are telegraph, telephone, stationery, office supplies, overtime, etc. I have found it advisable to eliminate in such reports items of expense which are practically uncontrollable insofar as the department head is concerned. I have reference to such items as heat, light, floor space, rental, janitor service, etc. Regardless of the view we take concerning these items, the supervisor invariably considers them as practically uncontrollable insofar as he is concerned—to report them only tends to obscure the real controllable figures on the operating report.

The second feature of the plan is the determination of a practical index which will equitably reflect the relative output of each department concerned. In the majority of cases this index will not be a highly scientific one in the sense that it is based on a detailed job analysis of all operations performed in the department. Rather, it might be said to be a practical index which reflects in a general way the relative output. For instance, the unit "number of checks written" may possibly be considered as an equitable index for a Cashier's Section or an Accounts Payable Division. True, the clerks in these sections might perform numerous other duties; however, from month to month this unit would reflect the relative volume of work performed. This is true—particularly in view of the fact that as a rule other miscellaneous duties will fluctuate with the unit selected. Other units which are sometimes used for different departments are "number of invoices written," "number of letters received and answered," "number of tabulating cards punched," and where general departments are concerned, "volume of sales or shipments" expressed either in units or dollars and cents. As stated before, it is well recognized that this plan is not highly scientific as viewed in the light of factory development. It has proved, however, to be highly practicable and effective and in my opinion should be the first step in the application of scientific principles to office management. Once this first step has been fully developed and effectively used, we can safely take up the subject of "determination of standards on individual operations."

The Production Control reports referred to a few moments ago, coupled with such simple personnel reports as Departmental Attendance and Tardiness, Labor Turnover, etc., serve as a basis of healthfully stimulating the self-seeking instinct of department supervisors. They provide a distinct incentive to him to exercise his constructive ability to organize and administer the work of his unit in a most economical manner, realizing as he will that the results of his efforts will come to the attention of his superior currently, and in a systematic and equitable manner, and that his reward or censure will be forthcoming accordingly. The production control units must of course be recognized by department supervisors as being fair and equitable, and each supervisor should have a hand in determining the proper unit or units used in his particular department. Once this confidence is established, the administrative problems having to do with the planning of operations and personnel activities become greatly simplified, and the highest type of cooperation naturally follows.

Two years ago this plan was instituted in the life insurance company with which I am now associated, employing approximately 350 clerical workers. The year following its introduction we handled an increase in volume of business of approximately 18 per cent with an actual decrease of 6 clerical employees. We have found our departmental supervisors much more amenable to constructive suggestions from the planning staff, and more reluctant to requisition additional clerical help indiscriminately, knowing as they do that it has an undesirable effect upon their departmental ratio of production to cost of production. These desirable results will only be forthcoming, however, when the highest administrative officers use the facts as recorded as a basis of supervision, holding department heads strictly accountable for the results reported.

In closing, I should like to present for your further consideration, an observation I have entertained concerning this whole subject of office development work, which seems to me to be fundamental. It is my personal opinion, gained from rather a wide experience in planning and administrative work, that the greatest impediment to the introduction of economies in the field of clerical administration is the diffidence with which the whole subject is viewed by the highest executives. This situation may be accounted for in two ways: first, except in a very few instances plans of clerical administration do not provide for a simple and effective method of reporting relative operating costs, results and other administrative data. Without this information the element of quality becomes unduly stressed, and no equitable recognition is forthcoming for economical administration. The plan as outlined above presents a basis for meeting this difficulty. The second reason for the passive interest taken by many administrative executives is even more fundamental and involves an economic viewpoint which has a deep significance in the science of management in general. It is illustrated in an experience (which I will quote) of an organizing engineer whose field of activities has been primarily among the British industrialists. He relates it as follows: "The Managing Director of a large mercantile house refused to consider a recommendation whereby a saving of six thousand pounds per annum could be effected in the operation of one department. The fact that the saving amounted to more than 25 per cent of the total expense of that department had no influence upon his decision. The important fact to him was that the saving was insignificant compared to the result of a fractional change in the market price of any one of the commodities handled." The author commented that this state of mind is due to the inertia of habit and the hesitation and reluctance to face the temporary annoyances attendant upon a change in the plan of operation or personnel.

Savings and economies in home office operations must be viewed by the management from a different angle if the necessary incentive is to be provided for those directly responsible for operations. In my opinion the field of office operations presents one of the most fertile grounds for the exercise of scientific management. Unlike many other sources of operating economy, the savings resulting from improvements have a cumulative effect—a realized economy in operation of a few thousand dollars a year may properly be multiplied by the number of years that the work is performed.

NECROLOGY

H. A. Ackerstrom, Student Branch, Wharton School.

Mr. Ackerstrom died in April under distressing circumstances—overwork and undernourishment brought on by his heroic effort to secure an education and at the same time support his mother in Sweden. The University of Pennsylvania granted him a posthumous degree.

"He Builded Better Than He Knew"[1]

Review of F. B. Copley's "Frederick W. Taylor"[2]

By John A. Fitch[3] { 658. 658.92

(Prepared for the Machinists' Monthly Journal by the Workers' Education Bureau of America.)

THE biography of Frederick W. Taylor by Frank Barkley Copley accomplishes two things. In the first place, it reveals the personality of the "Father of Scientific Management," as nothing previously written has done. It introduces the reader to a warm-hearted, impulsive genius, who went his own way with amazing perversity, who laid the basis for a new and better conception of the responsibilities of management. In the second place, the book reveals clearly—albeit somewhat unconsciously—why organized labor opposed the Taylor System, and why it had to do so. It is unfortunate that the author did not deal with the more recent trends of opinion in both scientific management and organized labor circles, for such a discussion would have revealed the development of a point of view on both sides that indicates a better understanding in each camp of the aims of the other than was true while Taylor was alive.

As a whole, this biography is singularly comprehensive and entertaining. No one who has anything like an open mind can read it without acquiring an enlarged appreciation and a new respect for Frederick W. Taylor. It does not make so much difference whether you believe in the Taylor System or not—even an opponent must be fascinated by the personality of the man. Here was a protagonist who fought hard for the principles in which he believed, and kept his faith even when misunderstood and misinterpreted by men of his own class. Here was a man, furthermore, who believed so firmly in the idea with which his name is associated that he could not doubt its validity, nor stop to understand everyone who opposed him; it was "law" and beyond questionings; and yet who believed so wholeheartedly and so disinterestedly that he gave the last fourteen years of his life absolutely without pay to spreading the gospel of scientific management. And here, too, was a craftsman of the highest order to whom there was joy in the work itself and who saw in every other craftsman a fellow and a brother. He had no use for "financiers" who are "looking merely for a turnover," who "have absolutely no pride of manufacture" and with whom it is "all a question of making money quickly."

You cannot read this biography without understanding why Frederick W. Taylor had friends such as few men ever do have. "Disciples" his biographer calls them, and that is the right word. But you understand why he had enemies, too; for he was often bitter and vehement and arrogant in his attitude toward those who opposed him.

One must be very careful to keep in mind the distinction between Taylor, the man, and the principles of scientific management that bear his name. Taylor, the man, was erratic and often very unscientific. He was the victim of an impetuous nature that prevented him from weighing all evidence coolly when pet theories were at stake. He was a curious combination of democrat and autocrat. He hated "putting on lugs"; he disliked senseless conventions or sham; he believed that the differences between men are apt to be superficial. He told the Harvard students that "the working man and the college professor have fundamentally the same feelings, the same motives, the same ambitions, the same failings, the same virtues . . . We are all of the same clay and essentially of the same mental as well as physical fiber."

On the other hand, he used to say to subordinates who were too free with suggestions: "You are not supposed to think. There are other people paid for thinking around here." He could not have men "starting a debate" when an order was given. He believed in instant obedience and respect for authority, so he deliberately set out, as a foreman, to be a "holy terror." He was abrupt and domineering even when giving praise. As Copley tells us:

> He would send for a man and say, "I've been watching you," and then, while the man was wondering what he had done, he would add, "Yes, I've been watching you, and I've discovered you are the kind of man who works just as well when the boss isn't around as when he is. Just for that I'm going to raise your pay. Now, damn you, keep your mouth shut."

And yet the men liked him. If we take the author's word for it they were devoted to him—probably because they knew he was honest, straightforward and not intentionally as brutal as the cold type makes him appear to be. In reality, the book as a whole gives you an impression of an unusual degree of innate gentleness and personal loyalty. It is only in individual instances that harshness seems the dominant note. A civil engineer who helped him lay out the grounds of the home he built near Philadelphia said of him: "My first impression of Mr. Taylor was that he was a terror. Gradually this was succeeded by the consciousness that a more just, democratic and kindly man never lived." And his friend and gardener said after Taylor's death: "All that is in me which is worth while I owe to Mr. Taylor."

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[1] Reprinted, by permission, from *Machinists' Monthly Journal* (Official Organ of the International Association of Machinists), Vol. xxxvii, No. 4, April, 1925, page 199. The title is ours.

[2] "Frederick W. Taylor," by Frank Barkley Copley. In two volumes, Harper & Bros., New York, 1923.

[3] Director of Industrial Courses, New York School of Social Work.

One cannot avoid the conclusion that a good deal both of enthusiastic support and of bitter hostility was aroused as much by the personality of the man as by the merits or demerits of his system. It is fortunate, therefore, that the system as well as the man receives ample treatment; indeed, for the layman this biography is probably the best general statement of the Taylor system in print.

The whole idea, according to the author, arose out of Taylor's experience as gang boss and foreman in the machine shop of the Midvale Steel Company. He started as a laborer, and by degrees was promoted from one job to another until he found himself in charge of the shop. All along he had known that the men were "soldiering." As a machinist he had "soldiered," too, but as foreman he was determined to abolish the practice. His own account of how for three years he fought with his men over the question of what is a day's work, at the end of which time he won a partial victory, is best told in Taylor's own book, "The Principles of Scientific Management." There, too, is to be found one of the best explanations of some of the basic reasons for soldiering to be found anywhere.

Despite the winning of this partial victory over his men, Taylor was not satisfied. The trouble was that "we do not know what is a proper day's work." Soldiering under piece work was due, he felt, to fear lest an increase in production might lead to a cut in the piece rate. He believed, however, that if piece rates were based not on the actual performances of the workmen in the shop, but "on the facts as revealed by a careful investigation, their motive for soldiering would be destroyed."

This idea was the beginning of scientific management. From the problem of getting results from labor it was a logical step to the problem of shop equipment, for, after all, what Taylor wanted was not just to induce men to work hard, but so to organize all the forces under his direction as to achieve the maximum in quantity and quality of output. He defined the problem of the machine shop as that of "removing metal from forgings and castings in the quickest time." This meant two things: the development of the best tool, and the most advantageous use of that tool by the workman. Consequently, in addition to time studies, record cards and functional foremanship, Taylor began a series of experiments in cutting metals which led to the discovery of so-called "high-speed" steel—an achievement that brought him world-wide recognition.

There is neither space nor need here for a discussion of the various factors involved in the Taylor system of scientific management. It does seem worth while, however, to give some consideration to the methods followed in developing its two principal aspects mentioned above.

On the side of the development of the best possible tool, we see beyond question Taylor, the engineer, the scientist. Years were expended, tons of steel consumed, in discovering the best quality of steel for cutting tools, the angles at which they should be set, the depth and speed of cut, and so on. There could be no limit to time or patience in determining objective facts of this sort.

On the other side of the problem, that of what constitutes a day's work, Taylor appears to have been less fastidious. Six months devoted to a study of the angles for cutting tools brought negative results, so the study went on for two years, but in discovering the amount of work a man could do in a day the experiments seem to have been less persistent. "Two first-class laborers, to whom were paid double wages," were selected, and the time study man observed them "for weeks."

The reviewer does not mean to suggest here that Taylor was consciously unmindful of the interests of the worker, and he has no notion that the Taylor system has ever meant overwork. The experiments carried on had as their purpose the prevention of overwork as much as anything else, and they doubtless have contributed to that end. Not only is that the case, but Taylor was as much opposed to the exploitation of labor through the vicious method of cutting the piece rate as any union leader. He has been criticised for not offering the worker a wage increase proportional to the increase in output resulting from the adoption of scientific principles, but he scorned those who scrimped and haggled over pennies in dealing with labor. During one of his lectures a manufacturer present "questioned the need of giving workers a bonus of from 35 to 50 per cent for maintaining standards; in his opinion 20 per cent would be plenty. 'Well,' said Taylor, peering at him over his spectacles, 'you are a damn hog.' "

Nevertheless there was a great contrast between Taylor's methods in finding out the truth about things and his methods in finding out the truth about men. In the former field he was scientific, in the latter unscientific. That is not surprising, for few men can play more than one role successfully. It was enough that Taylor was an engineer—he could not rightly be asked to be an economist and a sociologist as well. But the trouble was that Taylor was apparently as sure of himself in the field of economics and sociology as he was in engineering. In both fields he was dogmatic. Consequently, he fell into errors of various sorts, and often contradicted himself. For example, he declared in his "Principles" that scientific management has as its "very foundation" the idea that the interests of employer and employee "are one and the same." He thought that the question of the rate of wages could be reduced to a scientific formula, no more to be bargained over than the question of the hour for the sun to rise. But he forgot these theories in the face of concrete realities. When he was promoted to a foremanship over the machinists with whom he had formerly worked, he "told them plainly that he was now working on the side of the management"—a thing that could hardly be said to exist apart or different from the "side of labor," if the principle of identity of interests as confidently set forth above was true.

This failure to subject economic phenomena to the same clear-headed scrutiny that he gave to problems in the field of physical science did more than lead to the fallacy that economics and physics are subject to equally determinable laws. It was responsible for his failure to grasp the significance of one of the most important economic developments of his day—trade unionism. Frederick W. Taylor understood the desire of men individually to get ahead. His relations with his employees were individual and direct. It was a simple relationship, involving the giving and the taking of orders. That, to him, was the natural way and the efficient way. He never thought of workmen in the mass as workers, cut off from certain rights and privileges, because they were workers. He thought of individual effort as the only way to make progress. An honest day's work must result in an honest day's pay—and he never really weighed the risk that the honest worker runs of not getting his honest pay because of a dishonest or stupid employer. He waved that all aside with the dictum that "nobody but a fool" would treat labor that way; but he had no formula for the defense of the workers against the "fool" employer. Or if a growing understanding of scientific principles in management was a formula, it was one that left the worker at the mercy of such an employer until he chose no longer to be a fool.

But in the development of this very formula—in the scientific management principles worked out for the salvation of both employer and employee—here, too, there was evident a lack of understanding of the workers' point of view. The idea of bargaining with an organized group was utterly opposed to Taylor's ideas of management. It could not be done; you could not in his view bargain over the laws underlying a science. He was opposed even to shop organizations promoted by the employer, and utterly divorced from trade union affiliations.

Of course, this meant warfare with the unions. It is quite true, as the author states, that in this warfare the union leaders did not always avail themselves of information they might have secured. It is, of course, equally true that Taylor and his associates did not try very hard to understand the trade unionists. They appeared to be quite unconscious of the basic historical facts that have made labor movements inevitable, and seemed to think of it as a superfluous and irritating interference with the process of sound industrial management. The present writer recalls with vividness the hostile reception accorded to the late Robert G. Valentine in a meeting of the Society to Promote the Science of Management in 1915 when he read his paper on Efficiency and Consent—the first outstanding discussion in that group in which the necessity of representation and bargaining was clearly set forth.

Much water has run under the bridge since 1915, and many of those who came to scoff at that meeting have since learned to pray. There is now a good deal of evidence that among the followers of Frederick W. Taylor there is a growing recognition of both the importance and the need of organized labor.

And on the side of the unions there is coming an increased recognition of the importance of developing through the economical use of both material and human energies the production standards written into union agreements, and the employment of engineers by unions to help promote efficiency in the shop.

For both of these developments Frederick W. Taylor was in a measure responsible. He was the prophet of efficiency. More than anyone else he taught the American people the value of economy in production. In an age that has been profoundly influenced by his teachings there can be no question of the extension of that influence to the leaders of organized labor, and as a matter of fact it has gone beyond all possibility of measurement. Even Lenin was so impressed that he advocated the adoption of the Taylor System in the factories of Soviet Russia.

On the other hand, Taylor was the prophet of a new sort of responsibility of management. Those managers and engineers who have followed his principles to their logical conclusions have found that management to be successful must meet the needs of the workers, and in the endeavor to do that they have found that labor must be consulted.

Reprint

The Momentum of Taylorism[1]

By Stuart Chase[2]

658.

Frederick W. Taylor died in 1915, a discouraged man. After the flare of public interest in 1911 and 1912, his work had retreated to its more normal obscurity, while labor was mobilizing for a massed attack on the new and hated methodology. The outlook for making management a genuine science was dismal enough. Had he lived another three years he would have seen the curve of his technique take a dizzying rush upward, and scientific management the talk and the aim—though not always the practice—of war production. And he would have seen the knowledge roll over Europe, until even Moscow listened while Lenin declared in 1918—"We must introduce the study and teaching of the new Taylor System." The impetus gained in the War has never been lost. The technique goes marching on, and that extraordinary man, who discovered that the most efficient life of a cutting tool was twenty minutes, may rest easy in his grave. He is secure among the immortals.

Mr. Hunt has gathered together a series of papers dealing with the course of the onward march. They are impressive, but in the mass they give the feeling of a front cut deep with salients. Perhaps this is as it should be. But one wishes somehow that Mr. Hunt had taken the learned monographs, digested them in the juices of his own mind, and given us an account more compounded and unified.

To me it seems that two profoundly important developments have come out of Taylor's work from where he left it at his death: the standardization movement with its bearing on industrial waste; and a new and more intelligent approach in dealing with labor. Mr. Hoover contributes a brief review of the former; Part IV is more or less concerned with the latter, carrying contributions by Robert G. Valentine, Meyer Jacobstein, William R. Leiserson, E. A. Filene and others. But I miss the strong relief into which, it seems to me, these two developments should be thrown. Meanwhile the high-powered executive who has a really scientific—rather than the more common romantic—regard for his business may be enormously stifled by a series of brain-cracking articles on master budgets, what to do in a buyer's market, the development of cost accounting as an aid to scientific management, and executive control generally.

I wish there was more about standardization. Hating as I do standardization in habits of thought, in dress, in amusement, in literature, I see unlimited opportunities for reducing industrial waste in standardizing intermediary products and processes—screw threads, paper sizes, axes and nails, containers, house paint . . . While before standardization of quality—shoes that would wear, scissors that would cut, fittings that would last—one stands as it were on the brink of Utopia. Imagine, if you can, a world where the goods that you bought were made to a tested and guaranteed standard, and the national advertiser could blah his head off without effect upon any intelligent purchaser! Perhaps—impious and blasphemous thought—in such a world there would be no need for the national advertiser at all. Standardization, says Mr. Whitney of the American Engineering Standards Committee—philosopher and artist as well as engineer—standardization intelligently applied provides a technique for a great release of the human spirit. It can get the humdrum work of the world done with a minimum effort and waste, leaving an increasing margin of time for creation, for investigation, or for dreaming in the sun. These aesthetes who roll their eyes to heaven whenever Ford is mentioned have failed—quite signally failed—to appraise their world.

Then there is labor. From the bitterest sort of opposition to Taylor and all his works, organized labor, where it is not indifferent, is experimenting with schemes of one kind and another involving production standards, joint management over certain industrial functions and processes, scientific routing and wage setting. The garment trades, the machinists, many miners and railroad workers have learned that there can be no increase in real wages until industrial waste is checked . . . .

Yes, this is a good book, a stimulating book, but with the highest respect to all the learned contributors, I wish Mr. Hunt had written it himself, and so appraised its wider social implications with a more compelling unity.

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[1] Reprinted by permission from *The New Republic*, March 25, 1925—a review of "Scientific Management Since Taylor," edited by Edward Eyre Hunt; McGraw Hill Book Company, Inc., New York, 1924, pp. xv, 263.

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Reviews

Practical Foremanship, by Glenn Lion Gardiner, McGraw Hill Book Co., Inc., New York, 1925, pp. 11, 183. (658.31243.)

The great world war and its labor problems, as much as any other one factor, focused the spotlight of attention on the foreman and his role in industrial management. Formerly looked upon as an obscure minor executive, he was after the war considered and referred to as the "key man," the representative of management, the connecting link between management and the worker.

The new importance attached to his work and his new status gave rise to extensive analyses of the foreman and his job, and it was found in the light of these changed conditions that his industrial education had been sadly neglected. As a result there appeared, very shortly after, a flood of foremanship courses and literature, ranging from the best to the most mediocre.

Gardiner's "Practical Foremanship" represents the results of a large university's[1] effort in carrying its extension work to industry and serves as a basis for its class discussions. It is written in a readable, non-technical style, and dealing as it does with the fundamentals of good foremanship, is of necessity elementary in its nature.

General manufacturing activities, such as employment, placement, training, planning, safety work, wage payment, inspection and production, on any one of which volumes have been written, are well covered both as activities and responsibilities of foremen and as responsibilities of special centralized departments. It is regrettable that space did not permit the inclusion of functional foremanship as advocated by Frederick W. Taylor.

The chapters dealing with the keystone of all good foremanship, the art of handling men, and the cultivation of industrial good will are most interesting, presenting as they do homely, well-known truths and rules of action which any foreman would do well to use as a basis for introspection.

PAUL NEUBER[2]

Sharing Management with the Workers. By Ben M. Selekman, Russell Sage Foundation, New York, 1924, pp. xiv, 133. (658.3151).

This book is a case report of a single experiment in sharing management with the workers. The case is well suited for study. The Wappingers Falls Bleachery, situated in a small "company town," employing 600 operatives, launched forth in 1918, almost without preliminary steps, upon a striking experiment in cooperative management. One representative of the employees and another of the town were added to the board of directors. Full control of plant policies, apparently even to the election of major executives, was delegated to a joint board, one-half chosen by the employees. Housing and similar community policies were placed in the hands of an employees' committee. And with this responsibility the right to one-half of the new profits was transferred to the employees to be used partly as an unemployment and sickness insurance reserve, and partly as direct extra remuneration. The apparent fullness of these measures, however, was abridged by reservations. The directors retained unqualified power to annul the entire plan. The action of the employees' committee was made subject to the review of the joint board and to its sole right of appropriation. Net profits were to be computed only after the payment of a 6 per cent dividend. Moreover, the unrestricted right of the foremen to "hire and fire," which was left unchanged by the plan, contrasts with its more democratic provisions.

Such an experiment obviously could not (as what experiment can?) form a safe pattern for *facsimile* repetition elsewhere. But it provides a case of unusual interest and suggestive value. Unfortunately, the author tells only the story of the first three years of this experiment now over six years old. He thus leaves wholly unanswered the vital question of how these conditions and measures have worked out in the second half of the time the plan has been in operation when greater remoteness from the initial impetus and novelty have rendered its enduring aspects more apparent. The spectre of the half of the story still untold haunts whatever facts are given and saps their vitality. Certainly with only one-half the evidence in, no one has a right to appraise any part of the experiment.

The general outlines of the experiment during the limited period covered by the report, the conditions under which it was made, the steps taken, the results that followed are simply and clearly set forth. But to have such a case report of full value as an aid in forming an opinion as to steps to be taken elsewhere, it is necessary to have more than a clear description of the conditions, the measures and the results: it is necessary to have the extent to which the various forces operated in bringing about these results appraised by the investigator. For this interplay of forces is vital, and the first-hand investigator alone can judge of the relative part played by each. What effect did the abruptness of the change have upon the results? In what way did the size of the plant, its isolation, the personality of the dominant director who almost alone carried the plan into operation, etc., affect the situation? In respect to such questions also, the full story does not seem to have been told.

Today, the wide extent of the effort to improve managerial policies, both in the wisdom and fullness of execution, through arriving at them by the common consent of those in whose hands as executives and operatives their execution rests, renders every accurate investigation and report of the experiments already made a contribution to management. The accuracy of this investigation merits a supplement providing an equally accurate statement of the second half of the experiment and more incisive analysis of the interplay of forces, especially in their relation to the problems of plant management.

ELLIOTT DUNLAP SMITH[3]

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Office Management, Principles and Practice. By William Henry Leffingwell, A. W. Shaw Co., Chicago, 1925, pp. xxviii, 850. (651.)

The name Leffingwell has long been recognized as an authority in managerial fields with particular reference to the office. Therefore, this new treatise by this author—dedicated, by the way, to the Taylor Society as an appreciation of its inspirational and educational influence—will be read with particular interest.

The motive behind its publication is clearly explained in the preface where the author says: "A pressing need exists for a thorough understanding on the part of business men in general, and office managers in particular, of the fundamental principles underlying the work of that pioneer of scientific management, the late Frederick Winslow Taylor . . . . . Therefore, in order to bring out these facts and principles more clearly, so that they may be readily apprehended by all engaged in business, I have attempted in this work to explain the scientific basis of office procedure, and at the same time accord to the profession of office management the dignity and position it deserves."

A study of the volume will convince the fair-minded reader that Mr. Leffingwell has carried out his purpose admirably and that his book is a notable constructive addition to the literature on office administration.

The importance of the subject is brought home early in the volume where Mr. Leffingwell points out that the number of people engaged in clerical work has increased from 172,575 in 1880 to 2,951,008 in 1920. He adds this significant comment: "This vast army of clerical employees outnumbers any other single occupational trade in the population, agriculture excepted. It exceeds by many hundreds of thousands the figures for each of the three next largest trade groups—railroad workers, miners, and iron and steel workers."

It is, indeed, a far cry back to those days of high desks and tall stools when elderly gentlemen clerks diligently entered long rows of figures in ponderous books and then spent many a midnight hour in adding them up to strike a balance. But a vast sum of money is being literally thrown away in business today because thousands of offices are being operated without regard to the sound principles of management which are essential to the successful solving of the clerical problem as it exists today.

The author believes that office management can and should become as near an exact science as factory management. The reviewer is in hearty accord with this belief and feels that the principles presented by the author in such chapters as the ones on Control, Standardization, Scientific Analysis, Formation of Routines, Planning and Scheduling, Tests, Training, Storage and Issuance of Supplies, and Incentive Wage-Payment Methods should leave little doubt in the executive's mind on this point.

While there may be some criticism that considerable space is allotted to what appear to be obvious subjects, it must be remembered that the book is based upon the needs as seen by Mr. Leffingwell in his practical experience, gained through the study of hundreds of offices—large and small. The reviewer believes that the completeness of the author's treatment is an advantage because it makes possible the use of the volume not only as a reference work by the general executive, but as a practical and valuable handbook by the office manager.

GEOFFREY S. CHILDS[4]

Profitable Science in Industry. By Dwight T. Farnham,[5] R. W. King,[6] James A. Hall,[7] and H. E. Howe.[8] The Macmillan Company, New York, 1925, pp. x, 291. (6.)

The purpose of this book is to bring out the close alliance between modern industry and science, not only the science which has accumulated to date, but research into a vast number of new fields. The foreword is written by President Stratton of The Massachusetts Institute of Technology, who as former director of the Bureau of Standards has done as much as any man of this generation to apply science to industrial problems. Four distinct phases are presented.

Mr. Farnham shows the application of science to management, made necessary even in traditionally empirical industries by the increasing scale of production. He emphasizes particularly the recent developments in budgeting and financial control, and brings together in a clear, concise way the ratios and other data for the control of finance, sales and production.

Mr. King shows the part that scientific research has played in the electrical industries such as power generation and distribution, communication, illumination, X-rays, and industrial chemistry.

Professor Hall shows the contribution of scientific research in mechanical engineering fields such as steam and hydraulic power plants, internal combustion engines, the cutting of metals, etc. He brings out clearly that improvement of the general wage level must come from increased production and technical improvements. "In most of our manufacturing establishments an increase in wage rates of 15 to 20 per cent for all persons on the payroll, without raising the production or selling prices, would wipe out all returns on the capital invested." Any far-reaching improvement in the standard of living therefore must come from advances in technique through scientific research. The steady lowering of the cost of light and power is directly due to scientific research in spite of steadily rising costs of fuel, machinery and labor.

Mr. Howe shows the great effect of science in industrial chemistry. In no other field, except possibly the electrical industries, has scientific research played so important a part. Mr. Howe closes the book with a chapter on scientific research as an association activity. He gives the experience of various industries with cooperative research, where all the industries contributing share in the benefits.

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[8] Editor of *Industrial and Engineering Chemistry*.

Different types of organization and methods for carrying on research are outlined. He indicates also some of the public bureaus and semi-public organizations which may be called upon for cooperation and assistance.

The book is informational in character, and useful to an executive, to emphasize the need for, and the present extent of, scientific research in modern competitive industry. With steadily rising costs of materials, American manufacturers are coming into world competition involving countries as well as individual concerns, and in several of these countries the value of science in industry is better known than in America. To meet this situation our progressive manufacturers must turn more and more to trained scientists. Not the least valuable service of the book is to show how this can be done by the smaller organizations through cooperative methods.

JOSEPH W. ROE.[9]

Fundamentals of Vocational Psychology. By Chas. H. Griffitts.[10] The Macmillan Company, New York, 1924, pages, xiii, 372. (150.)

According to the preface, "Fundamentals of Vocational Psychology" is intended for use as a text by classes in vocational psychology, but it seems better adapted to the use of the employment manager or the business executive who is not familiar with psychology and wishes to know what there is in vocational or applied psychology which may aid him in the selection, placement and training of his operators. The book is written almost entirely from the employment manager's point of view.

There is nothing new either in material or in attitude, but a comprehensive survey of the current practices in vocational psychology—both good and bad. In most instances the choice of illustrative material is good. In the case of the tests, the description is sufficiently detailed to give the reader an idea of what the tests are, but one who is not trained in psychology would not be safe in attempting to make use of any of the tests described without further study of the fundamental principles underlying them.

The chapter on correlations is a good review for one who has studied statistics, but is not complete enough to be of service to one unfamiliar with statistical method.

Before taking up the more scientific means of measuring individual differences, the author points out the fallacies in the various systems of character analysis based upon physiognomy or other physical characteristics. When one stops to consider the enormous sums of money which business men pay each year to "professional psychologists" who practise some of these systems, one realizes that these chapters are not amiss.

Despite all the work that has been done on tests of various abilities and despite the shortcomings of the personal interview as it is usually conducted, no test or group of tests has yet been found which will supplant the personal interview in the selection of employees. There is still much to be done in standardizing the interview so that its maximum possibilities may be realized. At present it is necessary, at least in filling positions of importance, to have the applicant interviewed by several persons. The author discusses some of the attempts at standardization,—as yet largely unsuccessful—such as testing the letters of application, determining the value of different items of the application blank, and testing ratings of photographs. The reviewer agrees that some form of the rating scale is useful to hold the interviewer to a definite field.

The author feels that tests should be used to supplement rather than replace the interview. His general attitude on the subject of tests is that what we have needed the past few years and still need is less selling and more research, whether the latter be in the university or in factories and offices.

The chapters on trade tests and general intelligence tests are the best in the book though not as concise and usable as the little book, "Psychological Tests in Business," by Kingsburg and Kornhauser.

Most of the space devoted to strength and endurance tests, tests of motor control and sensory capacity might better have been given over to a more complete discussion of trade and intelligence tests. The employment manager and vocational psychologist will find little of value in these chapters, aside from the few pages on fatigue. The time when the vocational expert will have at hand a catalogue, such as the author suggests, of the strength and endurance requirements for every line of work is in the far distant future, if ever. Such tests must be very elaborate, they require much time to give, and it is doubtful if the results are much more accurate than a competent physician can secure from a physical examination in a much shorter time.

Since the emotional reaction of the individual to his job is by far the most important factor in his success, it is unfortunate that this has received only slight consideration by the author.

In general, "Fundamentals of Vocational Psychology" is a good survey with an excellent bibliography.

CHALICE M. KELLY[11]

The Women's Garment Workers: A History of the International Ladies Garment Workers' Union. By Louis Levine, Ph.D. B. W. Huebsch, Inc., N. Y., 1924, pp. xxvi, 608. (331.88)

It would be inaccurate to say that this history of the Ladies Garment Workers' Union is typical of the situation confronting all employee groups in this country, or that the justification of its existence, which this book convincingly supplies, is in any complete way the justification of all American unionism. This industry was in origin peculiarly confined to our largest cities; it was for a long time first-generation immigrant among both employers and employees; it was a business requiring very little capital; it was fiendishly competitive. In those respects its characteristics were its own. Yet in facing many of the larger issues its members faced the same difficulties as all manual workers in the years from the early eighties down to the present. And in relation to these issues, this history supplies evidence which has significance for an understanding of all American unionism.

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[9] Professor of Industrial Engineering, New York University.

[10] Assistant Professor of Psychology, University of Michigan.

[11] Employment Department, National Carbon Co., Long Island City, N. Y.

This narrative is important to those interested to foster a science of management because it shows a large and prominent union growing intellectually in a direction which is broadly in harmony with policies they are advocating. The reader sees in interesting perspective the trade union mental evolution which had its definite counterpart in the mental evolution simultaneously undergone by many engineers and managers within the Taylor Society itself. There is a good characterization of the work and influence of Robert G. Valentine in this industry in 1915-16; and it was during the consulting labors of Mr. Valentine for this union in New York in 1915 that his famous paper on the relation of efficiency to consent was given before the Taylor Society. These and other influences at work in the union and among the managers eventually bore fruit more tangibly than in 1916, when Mr. Valentine's death joined with other causes to bring to a halt the experiment over which he presided.

In consequence, by 1924 the scene presented a radically different complexion. The collective agreements in Cleveland, for example, since 1919, and in New York City in 1924, have embodied concretely a new emphasis in policy which is a marked departure from typical union views. At least, these agreements have established certain principles as acceptable; and their fuller development is only a matter of time. These principles may be briefly summarized as follows:

1. Acceptance by the union of a share in responsibility for getting production.
2. Use of guaranteed weekly pay rates; but use of payment incentives for work done above a defined standard.
3. Definitions of fair minimum standards of amounts of work on a basis of careful study of jobs, determination of amounts to take place under joint agreement.
4. Guarantees of regular employment for a defined number of weeks per year.
5. Guarantees of unemployment compensation for the weeks of idleness in excess of the number in which work is not guaranteed.

All this represents, of course, a virtual reversal in policy from that of many unions on questions of measured production, use of scientific methods to discover fair amounts of work, willingness to allow the better workmen to earn more than the union scale—in fact, the whole cooperative emphasis in the matter of production. The workers get, in return, a longer working year and the pledge of compensation for prolonged idleness—assuming that industrial conditions in general do not become too depressed. Hard work will not, under normal conditions, work them out of a job. Honest application to work is calculated to bring larger wages for the workers and lower unit costs for the employers. All this does not solve the problem of defining a fair day's work and of paying a fair return to the workers. But it does provide a sensible and approved method for narrowing the possible area of conflict over work and pay, by widening the area in which facts can have their mediatory influence.

Indeed, if its present program carries on, this union will go down in history as among the very first of those within the fold of the American Federation of Labor to realize that its prosperity and the industry's prosperity are inseparable, and that all the union can do to strengthen the industry will in turn strengthen it. It stands thus to exercise no little influence as an object lesson to other unions confronting similar problems. But to do this the union must, to use Dr. Levine's telling phrase, carry through successfully with its "new synthesis of trade union realism and social idealism."

The continuance of such a program does not, of course, come by chance any more than its inception did. It comes because certain leaders have had the vision and determination to win others to their point of view. And in the present situation a program as liberal, moderate and tolerant as this, in a group a large fraction of whom are party socialists, requires a real educational program to be put over. The formal educational and social welfare work of the union (with an annual budget of $17,500) is not tied up too closely with the inculcation of these matters of policy, but is devoted to cultural ends, physical and intellectual, of a more general character. Yet it is reasonably certain that the increasing attention paid by the union to formal adult education is making it easier to retain the policies which are being worked out.

To the student of economic development in this country this book cannot be too highly recommended. It calls attention to new problems and throws new light on old ones. Perhaps as valuable as any feature is its practical insistence on what is to the union the obvious fact, that industrial problems cannot be solved if the rights, aspirations and desires of the manual working group are for long ignored.

ORDWAY TEAD[12]

Seasonal Operation in the Construction Industries, The Facts and Remedies. Report and Recommendations of a Committee of the President's Conference on Unemployment. McGraw-Hill Book Company, New York, 1924, pp. 213. (658.9:69)

Customs which became fixed when builders had not yet learned how to cope with adverse weather conditions are mainly responsible for seasonal idleness in the construction industries, not climate. The development of new equipment and new methods has made it possible to carry on most types of construction all year round in all parts of the United States. "It may be stated without fear of contradiction that both from an engineering and quality standpoint any type of modern building construction can be accomplished, and most classes of engineering construction fully as well, in the winter months as at other seasons, if the proper protection during the progress of certain parts of the work is provided." Nor is the cost of this prohibitive. "The available data indicate that even for those types of work primarily affected by weather conditions there is a decrease in the labor cost. On the remainder of the work not primarily affected by winter conditions it is also fair to assume at least a similar saving in cost due to increased productivity at seasons of relative inactivity . . . Where there are also taken into account the pecuniary advantages of more continuous operation of force and equipment, the lower material cost and the saving to the owner of capital time charges through quicker occupancy, it is evident that these latter can be considered almost entirely net savings. These facts, little appreciated by the building industry itself and entirely unknown to the owners, should if properly impressed on the minds of the owners contemplating building, result in an appreciable decrease in the present seasonal fluctuation in building."

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[12] New York School of Social Work.

These and similar statements are to be found in a study which is important not only for what it says but for the persons who say it. Responsibility for the extracts quoted is taken by a committee of the President's Unemployment Conference, appointed by Secretary Herbert Hoover to make a thorough study of seasonal operation in the building trades. The committee includes a representative group of men of national repute as builders, manufacturers of building materials, architects, bankers specializing in financing building operations, consulting engineers, labor leaders in the building trades and others with intimate knowledge of the conditions. The actual investigation was carried on largely by the staff of the Division of Building and Housing of the Department of Comerce.

The study brings out three important conclusions. First, that winter construction is entirely practicable from a technical standpoint. Emphasis is laid on certain elements of scientific management, particularly on careful planning. By the right kind of schedule the shell of a building may often be made ready by the time winter comes, then by closing it in, the interior work may be completed with artificial heat. There are numerous difficulties in planning operations, but no greater complexities than are encountered in some other industries where uniform working schedules have become a regular practice of the better plants. When planning does not make it possible to avoid outdoor work, there are methods of conducting construction in cold weather without deterioration to the building, and ample practical advice is given on such points.

The second conclusion, already indicated, is that winter construction is not merely practicable technically but is practical from a business standpoint as well. Winter construction may even yield a profit over peak load operation, and in any event need not involve more than a slight addition to costs.

These two significant conclusions focus attention on the third, explaining why seasonal operation remains the rule in the trade. Tradition is seen as the crux of the whole problem. However, the knowledge that custom, not climate, is mainly responsible for seasonal idleness in the building trades puts us only one step nearer to a solution of the problem. For customs, the sociologist tells us, are generally more stubborn than technical obstacles. The latter may often be solved completely by the work of a single scientist; the former may present the huge problem of changing the habits of a nation.

The individual builder is practically powerless to modify social custom. Public authorities, such as the federal, state and municipal governments, must be induced to substitute for their clumsy ways of letting contracts on buildings, roads and other construction work, methods of far sighted planning which take account of both cyclical depressions and seasonal slack times. Public utilities must be induced to follow a like policy. Individuals letting contracts for commercial and industrial buildings and builders of homes must be educated to make their decisions earlier and allow for better planning. Landlords must be persuaded to establish several leasing dates every year in place of a common single leasing date. Contractors and builders themselves, used to the old methods, must be taught to experiment with longer seasons of building and to develop more of an interest in the subject of continuous employment and operation.

The report sees this issue clearly. In the strongest terms it urges organization for propaganda purposes. It advocates the organized effort of the professions and of the various trade groups concerned, individually and collectively, locally and nationally. It points to the need of personal persuasion, of newspaper publicity, of circulars and advertising. It outlines in detail methods by which every organized group or interest may promote a common program. If the investigation is not too optimistic in its conclusions as to the technical facts, one may say that all-year building is no longer a major problem of scientific management. It is the social problem of getting society to accept an improved mode of action.

H. FELDMAN[13]

Employees' Representation in Coal Mines. A Study of the Industrial Representation Plan of the Colorado Fuel & Iron Company, by Ben M. Selekman and Mary Van Kleeck, Russell Sage Foundation, New York, 1924, pp. xxv, 454. (658.3151.)

This is one of five industrial studies, either made or in progress, by the Russell Sage Foundation; the others are: The Industrial Representation Plan of the Minnequa Steel Works, The Partnership Plan of the Dutchess Bleachery, the Works Council of the Rock Island Arsenal and the employment policies of William Filene's Sons Company in Boston.

The usefulness of the book is greatly enhanced by a synopsis of nine pages which answers most of the general questions one would naturally ask about the Plan.

What is the Plan? "At each mine two or more representatives, in accordance with the number of men employed, are elected to serve for one year. These employees' representatives from all branches of the company come together

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